ICONES PLEUROTHALLIDINARUM
XV

SYSTEMATICS
OF
TRICHOSALPINX

ADDENDA TO DRACULA, MASDEVALLIA, MYOXANTHUS AND SCAPHOSEPALUM

CORRIGENDA TO LEPANTHES OF ECUADOR

(ORCHIDACEAE)

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Carlyle A. Luer

Missouri Botanical Garden

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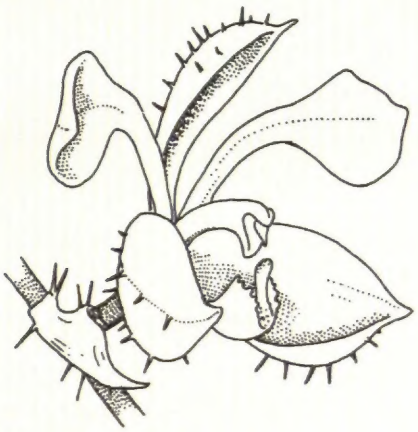

Trichosalpinx dependens, Cordillera del Cutucú, province of Morona-Santiago, Ecuador, altitude 950 meters above sea level, 17 January 1989, photograph by Alexander C. Hirtz.

SYSTEMATICS OF THE GENUS *TRICHOSALPINX* (ORCHIDACEAE)

ABSTRACT

The genus *Trichosalpinx* Luer, one of four pleurothallid genera characterized by lepanthiform sheaths of the ramicaul is described, and a key to the four subgenera and species is given. Each species is described and illustrated.

New taxa:
Platystele xiphochila (Rchb.f.) Luer, comb. nov.
Trichosalpinx subgen. **Pseudolepanthes** Luer, stat. nov.
Trichosalpinx subgen. **Xenia** Luer, subgen. nov.
Trichosalpinx amygdalodora (Kränzl.) Luer, comb. nov.
Trichosalpinx atropurpurea Luer, sp. nov.
Trichosalpinx barbellifera Luer & Vásquez, sp. nov.
Trichosalpinx bricenoënsis Luer & Escobar, sp. nov.
Trichosalpinx calceolaris Luer & Escobar, sp. nov.
Trichosalpinx caudata Luer & Escobar, sp. nov.
Trichosalpinx dalstroemii Luer, sp. nov.
Trichosalpinx decorata Luer & Escobar, sp. nov.
Trichosalpinx dressleri Luer, sp. nov.
Trichosalpinx ectopa Luer & Escobar, sp. nov.
Trichosalpinx escobarii Luer, sp. nov.
Trichosalpinx fasciculata Luer & Hirtz, sp. nov.
Trichosalpinx fissa Luer, sp. nov.
Trichosalpinx gentryi Luer, sp. nov.
Trichosalpinx hamiltonii Luer, sp. nov.
Trichosalpinx hirtzii Luer, sp. nov.
Trichosalpinx jimburae Luer & Hirtz, sp. nov.
Trichosalpinx lamellata Luer & Hirtz, sp. nov.
Trichosalpinx lenticularis (Luer) Luer, comb. nov.
Trichosalpinx ligulata Luer & Hirtz, sp. nov.
Trichosalpinx lilliputalis (Luer & Hirtz) Luer, comb. nov.
Trichosalpinx macphersonii Luer, sp. nov.
Trichosalpinx metamorpha Luer, sp. nov.
Trichosalpinx parsonsii Luer & Dod, sp. nov.
Trichosalpinx patula Luer, sp. nov.
Trichosalpinx psilantha Luer & Vásquez, sp. nov.
Trichosalpinx ramosii Luer, sp. nov.
Trichosalpinx silverstonei Luer, sp. nov.
Trichosalpinx solomonii Luer, sp. nov.
Trichosalpinx spathulata Luer, sp. nov.
Trichosalpinx steyermarkii Luer, sp. nov.
Trichosalpinx strumifera Luer & Hirtz, sp. nov.
Trichosalpinx tantilla (Luer) Luer, comb. nov.
Trichosalpinx teaguei Luer, sp. nov.
Trichosalpinx teres Luer, sp. nov.
Trichosalpinx uvaria Luer, sp. nov.
Trichosalpinx vasquezii Luer, sp. nov.
Trichosalpinx wilhelmii Luer, sp. nov.
Trichosalpinx zunagensis Luer & Hirtz, sp. nov.

The first species attributable to the genus *Trichosalpinx* was described in 1816 as *Dendrobium pusillum* in *Genera Species Plantarum* by Humboldt, Bonpland & Kunth from a collection by Humboldt and Bonpland in 1802 near Loja, Ecuador, where it still occurs today. Lindley transferred it to *Specklinia* in 1836, then to *Pleurothallis* in 1842. It is a member of subgenus *Tubella*.

The next two species of *Trichosalpinx*, members of subgenus *Trichosalpinx*, were described simultaneously by Lindley in 1838 in the genus *Specklinia* (*S. ciliaris* and *S. orbicularis*). Lindley described in *Pleurothallis* the fourth and fifth species (members of subgenus *Tubella*) as *P. arbuscula* and *P. intricata* in 1842 and 1846 respectively. Reichenbach also added species of *Trichosalpinx* in *Pleurothallis*, beginning with *P. lepanthiformis* in 1844. This practice was continued by Barbosa Rodrigues, Schlechter and others.

Eleven species of the future genus *Trichosalpinx* were recognized by Lindley in his *Folia Orchidacea Pleurothallis* in 1859. He segregated species of *Pleurothallis* with "lepanthiform stems" into "subsections" called *Lepanthiformes* in three of his "sections" (*Brachystachyae*, *Elongatae* and *Acuminatae*). These species were identified by the ramicauls (the stem of the plant between the rhizome and the abscission layer) enclosed by a series of imbricating, tubular, more or less ciliate sheaths similar to those found in *Lepanthes*.

The three species of *Trichosalpinx*, as well as many species of *Pleurothallis* described by Barbosa Rodrigues between 1877 and 1891, were attributed by him to *Lepanthes*. Cogniaux transferred them to *Pleurothallis*. In the Orchidaceae of Martius' *Flora Brasiliensis* of 1896, Cogniaux treated four species of *Trichosalpinx* in section *Lepanthiformes* of *Pleurothallis*. He also recognized as another section a distantly allied genus, *Lepanthopsis*, also with lepanthiform-sheathed stems. Cogniaux maintained his sections *Lepanthiformes* and *Lepanthopsis* in the *Orchidaceae Antillanae* of the *Symbolae Antillanae* edited by Urban in 1910.

Ames elevated Cogniaux's section *Lepanthopsis* to the generic level in 1933, but did nothing with section *Lepanthiformes*. The genus *Trichosalpinx* was proposed in 1983 for these species with lepanthiform sheaths customarily treated in *Pleurothallis* at which time 85 transfers from *Pleurothallis* were made. Today 108 species are known in the genus. They are widely distributed in the moist neotropical forests from southern Mexico through Central America, the Greater and Lesser Antilles, and South America into southern Brazil.

Lepanthiform sheaths are tubular, closely fitting sheaths of a ramicaul that are more or less imbricating, and longitudinally ribbed with an oblique, often dilated ostium with a thickened margin. The ribs and margins vary from short-ciliate or long-ciliate, minutely scabrous, or rarely glabrous. The pubescent sheaths of some unrelated species of *Pleurothallis*, *Restrepiopsis*, and *Stelis* are not considered lepanthiform.

A group of mostly Brazilian species, characterized by closely fitting, ribbed, sometimes minutely ciliate sheaths with non-dilated ostia with thickened margins, were thought to belong to *Trichosalpinx* when the genus was proposed. These species with a hooded, semiterete column with a column-foot are best retained as a subgeneric taxon in *Pleurothallis*. In 1975, Brieger based a monotypic genus, *Pabstiella*, on one of them (*Pleurothallis mirabilis* Schltr.).

Trichosalpinx is one of four pleurothallid genera distinguished by lepanthiform sheaths of the ramicauls, the other three being *Lepanthes*, *Lepanthopsis* and the recently proposed *Draconanthes*.

Lepanthes is distinguished by membranous petals that are almost always transversely bilobed; a lip that is commonly bilobed into blades with the middle lobe usually modified into an appendix; and a footless column of seemingly unlimited forms.

Lepanthopsis is distinguished by one-veined sepals; simple petals; usually a simple lip; and a short, transverse, membranous, footless column with an apical anther and an apical, bilobed stigma. The column is similar to that of *Platystele*.

Draconanthes is distinguished by fleshy sepals; entire, elongate, fleshy petals; and a cylindrical, footless column clasped by the sides of a thick, bilobed lip.

Trichosalpinx is characterized by the lepanthiform sheaths of the ramicaul; free or connate sepals; entire, ciliate, denticulate, or fringed petals; an assortment of lips; and four major variations of the column, one of the criteria used in separating the four subgenera. The species related to *T. ciliaris* are contained in subgenus *Trichosalpinx*. The ramicauls are non-prolific, usually stout and usually with large lepanthiform sheaths. The racemes are usually shorter than the leaf, the petals are ciliate or fringed, and the lateral sepals are more or less coherent. The lips are often ciliated with basal lobules. The column is stout and semiterete, with the apex more or less hooded, and with a column-foot.

The species with slender, often prolific ramicauls usually with thinner, more delicate lepanthiform sheaths, are grouped into subgenus *Tubella*. The sheaths of some species with very short ramicauls are almost glabrous or barely ciliate on the margins. Perhaps this suggests a transition into *Pleurothallis* subgenus *Specklinia*. The racemes of subgenus *Tubella* are usually longer than the leaf, the lateral sepals are more or less free, and the petals are entire. The lips are without basal lobules and not ciliated. The column is slender with a column-foot and the apex not hooded. However, isolated characters typical of the former subgenus also occur occasionally in the latter.

Subgenus *Pseudolepanthes* with ten small species is characterized by an elongated, successively flowered raceme. The sepals are variously ciliate-spiculate with the laterals either connate or free. The lip is thickened with a conspicuous, verrucose callus, and the claw-like base is firmly attached to the footless column. The column is more or less erect with the anther and stigma on the front surface.

In *Systematics of Lepanthopsis* (Luer, 1991), five non-conforming species were included in *Lepanthopsis* subgenus *Microlepanthes*. Five other misfits are gathered together here in subgenus *Xenia*. *Xenia*, "the strangers," is characterized by an elongated raceme; lateral sepals partially or wholly free; a fleshy, variously callous lip; and a short, thick, unhooded column with an apical anther and an entire, apical or subapical stigma.

Many species of *Trichosalpinx* are morphologically stable, but several large, widely distributed taxa are treated here as species-complexes composed of numerous, closely related variations: the *T. blaisdellii*-complex, the *T. dependens*-complex, the *T. dura*-complex, the *T. memor*-complex, and the *T. orbicularis*-complex. Within each, all combinations of the variations of morphological features are encountered, more or less throughout the range of the taxon. Recognition of each variation or combination of features would only perpetuate the confusion that already exists. Great variations in size and degrees of pubescence occur in all these complexes. No two populations are alike.

Trichosalpinx Luer, Phytologia 54: 393, 1983.

Type: *Specklinia ciliaris* Lindl., Edwards' Bot. Reg. 24: Misc. 31, 1838. [*Trichosalpinx ciliaris* (Lindl.) Luer].

Ety.: From the Greek *trichosalpinx*, "a trumpet with hairs," referring to the ciliated ribs and margins of the cauline sheaths.

Syn.: *Pleurothallis* sect. *Brachystachyae* subsect. *Lepanthiformes* Lindl., Folia Orch. *Pleurothallis* 25, 1859.

Lectotype: *Specklinia orbicularis* Lindl. (Luer, Monogr. Syst. Bot. 15: 65, 1986)

Ety.: From the genus *Lepanthes* Sw. and the Latin *-formis*, referring to the lepanthiform habit.

Syn.: *Pleurothallis* sect. *Elongatae* subsect. *Lepanthiformes* Lindl., Folia Orch. *Pleurothallis* 26, 1859.

Lectotype: *Pleurothallis chamaelepanthes* Rchb.f. (Luer, Monogr. Syst. Bot. 15: 68, 1986)

Syn.: *Pleurothallis* sect. *Acuminatae* subsect. *Lepanthiformes* Lindl., Folia Orch. *Pleurothallis* 32, 1859.

Lectotype: *Pleurothallis arbuscula* Lindl. (Luer, Monogr. Syst. Bot. 15: 68, 1986)

Syn.: *Lepanthes* sensu Barb.Rodr., Vellosia 1, ed. 2: 120, 1891, in part.

Syn.: *Pleurothallis* sect. *Lepanthiformes* (Lindl.) Cogn., Fl. Bras. 3(4): 579, 1896, in part.

Syn.: *Pleurothallis* sect. *Bipaleolatae* Pabst, Orch. Brasilienses 162, 1975.

Type: *Specklinia orbicularis* Lindl.

Ety.: From the Latin *bipaleolatus*, non-decipherable, but referring to the basal lobules of the lip.

Plants perennial, small to medium in size, epiphytic, terrestrial to lithophytic, caespitose, ascending to long-repent, sometimes pendent; roots few to many, coarse to slender. Ramicauls ascending to erect or descending, slender to stout, nonpseudobulbous, shorter to longer than the leaf, unifoliate, often prolific (producing another ramicaul from the apex), enclosed by a series of ribbed, tubular to infundibular, more or less imbricating sheaths, dilated at the ostia, more or less ciliate or scabrous on the ribs and the margins of the ostia, the inflorescence emerging laterally with an annulus at or near the apex, or the abscission layer. **Leaf** erect or suberect in relation to the ramicaul, thinly to thickly coriaceous, sometimes suffused with purple, more or less shortly petiolate, the blade broadly to narrowly elliptical, the apex acute to obtuse, notched with an apiculum in the sinus, the base contracted into the petiole. **Inflorescence** racemose (rarely reduced to 1 flower), shorter or longer than the leaf, the raceme congested to lax, strict to flexuous, distichous to secund, simultaneously to successively few- to many-flowered, with the flowers resupinate or non-resupinate, borne by an erect, ascending or descending, slender peduncle, often with a few bracts; floral bracts thin, tubular, oblique; pedicels slender; ovary smooth to costate; **sepals** variously colored, more or less ovate, with or without caudae, membranous to fleshy, carinate to subcarinate, glabrous to pubescent, often ciliate, the dorsal sepal essentially free or shortly connate to the lateral sepals, 3-veined, the lateral sepals essentially free to completely connate; **petals** small, membranous, entire, denticulate, or ciliate, **lip** variously shaped, or lobed, often ciliate, with or without calli, the base more or less flexibly attached to the apex of a well-developed column-foot; **column** elongate to short, terete, semiterete, often winged or cucullate, the anther and rostellum subapical to ventral, the pollinia 2, obovoid, free, flattened somewhat on the sides facing each other, with a granular caudicle, the stigma subapical or ventral, entire, the base of the column developed into a column-foot with the apex of the ovary.

Trichosalpinx subgen. **Trichosalpinx**

Type: *Specklinia ciliaris* Lindl. = *Trichosalpinx ciliaris*.

Syn.: *Pleurothallis* sect. *Brachystachyae* subsect. *Lepanthiformes* Lindl.

Type: *Specklinia ciliaris* Lindl. = *Trichosalpinx ciliaris*.

Syn.: *Pleurothallis* sect. *Lepanthiformes* (Lindl.) Cogn.

Syn.: *Pleurothallis* sect. *Bipaleolatae* Pabst.

Type: *Specklinia orbicularis* Lindl. = *Trichosalpinx orbicularis*.

This subgenus of at least 24 species is distinguished by the caespitose habit without prolific ramicauls; racemes shorter than the leaf (except for *T. pringlei*); sepals more or less fleshy with the laterals variously connate or at least parallel, sometimes recurving, sometimes forming a concave synsepal; petals ciliate or fringed (except *T. egleri*); and an oblong, often ciliated lip with a central callus and

usually with basal lobules. These lips are similar to those of many species of *Pleurothallis* subgenus *Specklinia* section *Muscosae*. The stout column is toothed at the apex that partially covers the ventral anther. The column-foot is stout. Except for lacking ciliated sheaths, some Brazilian species (i.e. *Pleurothallis microgemma* Schltr.) are practically inseparable.

The subgenus consists of four widely distributed, frequent and variable complexes (*T. dependens* in the Andes, *T. blaisdellii* in Central America, and *T. memor* and *T. orbicularis* in both Central America and the Andes); two frequent species with more limited distributions (*T. ciliaris* in northern Central America, and *T. egleri* in Amazonian Brazil and the Guyanas); and seven geographically restricted species that are more or less distinct from the rest. Except for *T. pringlei* and *T. ringens*, all the species of this subgenus seem to grade into each other.

Trichosalpinx subgen. **Tubella** Luer, Monogr. Syst. Bot. 15: 66, 1986.
Type: *Pleurothallis acremona* Luer = *Trichosalpinx acremona*
Ety.: From the Latin *Tubella*, "a little tube," referring to the cauline sheaths.
Syn.: *Pleurothallis* sect. *Elongatae* subsect. *Lepanthiformes* Lindl.
Type: *Pleurothallis chamaelepanthes* Rchb.f. = *Trichosalpinx chamaelepanthes*
Syn.: *Pleurothallis* sect. *Acuminatae* subsect. *Lepanthiformes* Lindl.
Type: *Pleurothallis arbuscula* Lindl. = *Trichosalpinx arbuscula*
Syn.: *Trichosalpinx* subgen. *Tubella* sect. *Tubellae* Luer, Monogr. Syst. Bot. 15: 68, 1986.

This subgenus contains about 68 interrelated species widely distributed throughout the range of the genus. They are distinguished by the usually slender habit commonly with proliferating ramicauls clad in lepanthiform sheaths. The racemes are longer than the leaf (short in *T. quitensis*); the sepals are more or less membranous; the lateral sepals are free or variously connate below the middle; the petals are entire; the lip is either simple or three-lobed; the disc usually bears a pair of variously modified calli; and the base is without lobules. The lip is similar to those of *Pleurothallis* subgenus *Specklinia* section *Hymenodanthe*. The usually slender column is variable in length with the anther subapical or ventral. The column-foot is either short or elongated.

Trichosalpinx subgen. **Pseudolepanthes** Luer, stat. nov.
Type: *Trichosalpinx pseudolepanthes* Luer & Escobar.
Ety.: From the Greek *pseudo-*, "false," and the genus *Lepanthes*, referring to the similarity of the species to that genus.
Syn.: *Trichosalpinx* subgen. *Tubella* sect. *Pseudolepanthes* Luer, Monogr. Syst. Bot. 15: 68, 1986.

This subgenus of ten closely allied species from western Colombia and northern Ecuador is characterized by the small habit with nonproliferating ramicauls clad in lepanthiform sheaths. The racemes are successively flowered and progressively elongated. The sepals are more or less membranous, ciliate or spiculate; the lateral sepals are free or variously connate below the middle; the petals are entire or lobed at the base; the lip is simple, but the disc bears a large, verrucose callus below which the broad, unguiculate base is firmly attached to the base of the column. The footless column is short and suberect with the anther and stigma on the front surface, except for the arcuate column of *T. spathulata*.

Trichosalpinx subgen. **Xenia** Luer, subgen. nov.

Type: *Trichosalpinx escobarii* Luer, Monogr. Syst. Bot. 64: 114, 1997.

Ety.: From the Greek *xenia*, "strangers," referring to the distinct characters of each species, apparently not allied with others in the genus.

Plantae parvae, vaginibus caulium lepanthiformibus, racemo elongato, labello crasso calloso lobato, columna tereti cum anthera et stigmate integro apicalibus.

This subgenus contains five individual species that are neither closely allied to each other, nor are they well accommodated in the above three subgenera, nor in the other three genera distinguished by lepanthiform sheaths. They present problems similar to *Lepanthopsis* subgenus *Microlepanthes*, and they could conceivably be brought together with them into a group of ten discordant elements. The alternative is the erection of several small or monotypic genera. Studies in DNA may eventually resolve these problems.

As presently conceived, subgenus *Xenia* is characterized by the small habit with nonproliferating ramicauls (except for *T. lilliputalis*) clad in lepanthiform sheaths. The racemes are elongated and either simultaneously or successively flowered. The sepals are glabrous and either caudate or noncaudate; the lateral sepals are free or variously connate below the middle; the petals are entire (long-caudate in *T. ballatrix*); the lip is thick and variously lobed and callous. The column is semiterete with an apical anther and entire stigma. The anther is dorsal in *T. lilliputalis*. The column-foot is short or absent.

KEY TO THE SUBGENERA OF *TRICHOSALPINX*

1 Plants caespitose (except *T. pringlei*) with nonproliferating ramicauls, slender to stout, with lepanthiform sheaths that are often coarse; racemes shorter than the leaf (except *T. pringlei*); petals often ciliate, denticulate, erose, fimbriate or serrate; lip with basal lobules (except *T. ringens*); column stout with a foot, hooded at the apex with the anther and stigma ventral (Fig. 1A.) ..... Subgenus *Trichosalpinx*

1' Plants caespitose, or with proliferating ramicauls; racemes commonly longer than the leaf; petals with entire margins (except *T. decorata*); lip without basal lobules 2

2 Ramicauls proliferating or nonproliferating; lip oblong, ovate, entire or trilobed, more or less with 2 or 3 small or longitudinal calli; column more or less slender with a foot, unhooded, with the anther more or less subapical (Fig 2A.) ..... Subgenus *Tubella*

2' Ramicauls nonproliferating; lip thick, broad, variously lobed or calliferous; column more or less stout, footless, with the anther more or less apical 3

3 Sepals more or less spiculate; lip with a conspicuous, verrucose callus, and with the unguiculate base fixed to the footless column (Fig. 3A.) ..... Subgenus *Pseudolepanthes*

3' Sepals glabrous; lip thick, variously lobed and calliferous (Fig. 4A.) ..... Subgenus *Xenia*

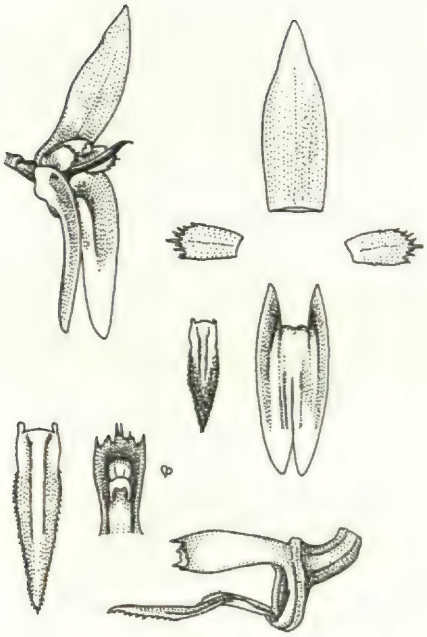

Fig. 1A. Flower and floral parts of subgenus *Trichosalpinx*

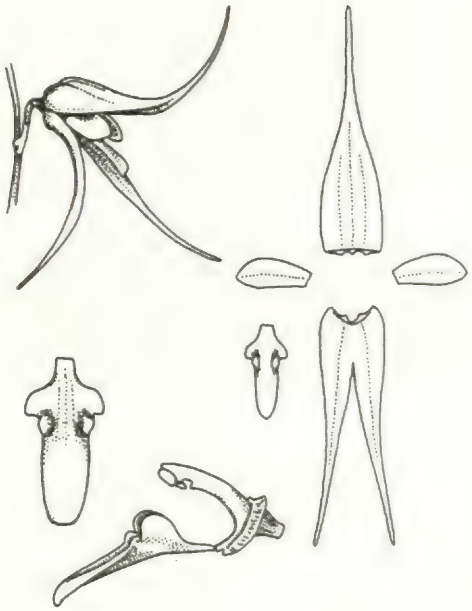

Fig. 2A. Flower and floral parts of subgenus *Tubella*

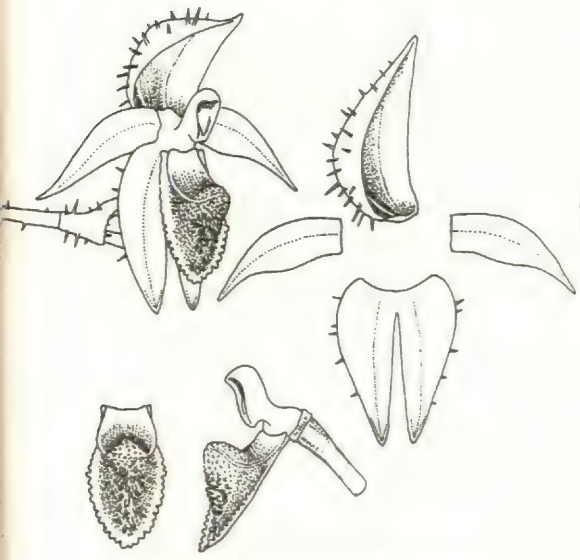

Fig. 3A. Flower and floral parts of subgenus *Pseudolepanthes*

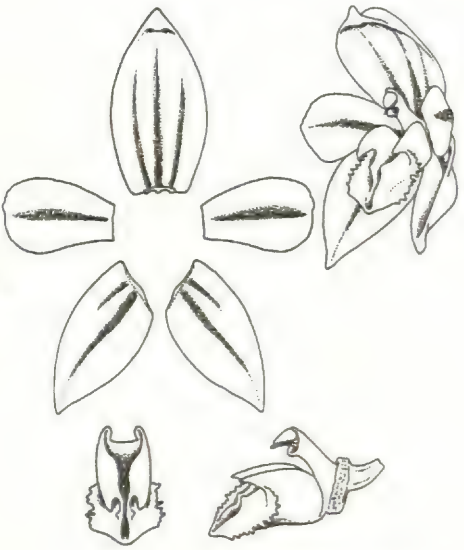

Fig. 4A. Flower and floral parts of subgenus *Xenia*

KEY TO THE SPECIES OF SUBGENUS *TRICHOSALPINX*

1 Plant repent 2
1' Plant caespitose 3

2 Inflorescence longer than the leaf ..... *T. pringlei*
2' Inflorescence shorter than the leaf ..... *T. navarrensis*

3 Inflorescence successively 1-flowered 4
3' Inflorescence more or less simultaneously 2-or-more-flowered 5

4 Sepals ciliate; lip with basal lobules ..... *T. inquisiviënsis*
4' Sepals glabrous; lip without basal lobules ..... *T. ringens*

5 Ramicaul more or less flexuous 6
5' Ramicaul strict 11

6 Lip glabrous 7
6' Lip ciliate 8

7 Raceme several-flowered, pendent ..... *T. berlineri*
7' Raceme 2-flowered, erect ..... *T. glabra*

8 Lip with the central callus entire 9
8' Lip with the central callus forked near the middle 10

9 Lateral sepals forming a concave synsepal ..... *T. dependens*
9' Lateral sepals recurved ..... *T. patula*

10 Ramicaul stout ..... *T. memor*
10' Ramicaul slender ..... *T. ciliaris*

11 Lepanthiform sheaths white; leaf obovate, striped in purple ..... *T. vasquezii*
11' None of the above 12

12 Lip nearly as long as the sepals ..... *T. egleri*
12' Lip distinctly shorter than the sepals 13

13 Petals triangular, acute, glabrous ..... *T. triangulipetala*
13' Petals not triangular, acute, glabrous 14

14 Lip narrow, attenuate, acute 15
14' Lip obtuse to round at the apex 17

15 Lateral sepals elliptical, approximate ..... *T. orbicularis*
15' Lateral sepals attenuated, diverging 16

16 Lip glabrous; lateral sepals not thickened toward the apices ..... *T. rotundata*
16' Lip ciliate; lateral sepals long-caudate and thickened ..... *T. caudata*

17 Lateral sepals forming a deeply concave synsepal with involute margins 18
17' Lateral sepals recurving above the middle 21

18 Synsepal glabrous; lip thin, narrowed above the middle ..... *T. psilantha*
18' Synsepal ciliate or pubescent 19

19 Lip with the central callus forked near the middle.....*T. memor*
19' Lip with the central callus entire.....20

20 Lip widest at the apex, glabrous.....*T. trachystoma*
20' Lip oblong, ciliate.....*T. dependens*

21 Lip with small, retrorse, basal lobules.....*T. blaisdellii*
21' Lip with larger, diverging, basal lobules.....*T. patula*

KEY TO THE SPECIES OF SUBGENUS *TUBELLA*

1 Ramicauls not superposed.....2
1' Ramicauls superposed (prolific).....33

2 Plant repent.....*T. fissa*
2' Plant caespitose.....3

3 Ramicauls dimorphic (sterile ramicauls short, fertile ramicauls elongate).....
.....*T. metamorpha*
3' Ramicauls not dimorphic.....4

4 Ramicauls shorter than the leaf.....5
4' Ramicauls at least as long as the leaf.....8

5 Lip with disc bicarinate.....*T. pumila*
5' Lip with disc not bicarinate.....6

6 Raceme elongate, several-flowered.....*T. systremata*
6' Raceme short, 1- to 2-flowered.....7

7 Sepals 11 mm long with tails; lip with a pair of round calli.....*T. webbiae*
7' Sepals 5-6 mm long with tails; lip without pair of round calli.....*T. nymphalis*

8 Lip with uncinate or pedunculate basal lobes.....9
8' Lip with broad, obtuse basal lobes, or without basal lobes.....15

9 Raceme longer than the leaf.....10
9' Raceme shorter than the leaf.....13

10 Lip with basal lobes pedunculate.....*T. oterion*
10' Lip with basal lobes uncinate.....11

11 Lateral sepals connate basally; petals acute.....*T. dirhamphis*
11' Lateral sepals connate at least to middle; petals obtuse.....12

12 Plant more than 5 cm tall; lip with acute, uncinate lobes.....*T. montana*
12 Plant less than 5 cm tall; lip with narrowly obtuse, uncinate lobes.....*T. dressleri*

13 Raceme congested; lip with basal lobes very short.....*T. quitensis*
13' Raceme lax; lip with basal lobes not very short.....14

14 Lepanthiform sheaths glabrous; lip with basal lobes acute.....*T. costata*
14' Lepanthiform sheaths with ciliate ostia; lip with basal lobes obtuse.....*T. teaguei*

15 Raceme longer than the leaf 16
15' Raceme shorter than the leaf 30

16 Peduncles fasciculate, 1- to 2-flowered ..... *T. fasciculata*
16' Peduncles 1- to 2, several-flowered 17

17 Lip with central lamella 18
17' Lip without a central lamella 20

18 Lip with the lamella cleft ..... *T. tenuis*
18' Lip with the lamella entire 19

19 Ramicaul much longer than the leaf; lip with lobes low, above the base of the lip ..... *T. hamiltonii*
19' Ramicaul about as long as the leaf; lip with lobes tall, occupying lower half of the lip ..... *T. lamellata*

20 Ramicaul less than 2 cm long 21
20' Ramicaul 2-9 cm long 27

21 Lip oblong, with 3 calli ..... *T. carinilabia*
21' Lip trilobed (lobes sometimes obscure) 22

22 Lip without mammillate calli 23
22' Lip with mammillate calli (calli sometimes obscure) 24

23 Sepals long-acuminate ..... *T. ligulata*
23' Sepals not long-acuminate ..... *T. crucilabia*

24 Sepals long-acuminate ..... *T. intricata*
24' Sepals not long-acuminate 25

25 Lip with anterior lobe triangular (plant minute) ..... *T. steyermarkii*
25' Lip with anterior lobe oblong 26

26 Lip with lobes on basal quarter ..... *T. pusilla*
26' Lip with lobes occupying lower half ..... *T. trilobata*

27 Ramicaul 4-9 cm long; raceme to 17 cm long ..... *T. dalstroemii*
27' Ramicaul 2-5 cm long; raceme 2-5 cm long 28

28 Dorsal sepal deeply cucullate, less than 4 mm long ..... *T. yanganensis*
28' Dorsal sepal not deeply cucullate, more than 5 mm long 29

29 Lip with mammillate calli ..... *T. intricata*
29' Lip without mammillate calli ..... *T. multicuspidata*

30 Inflorescence 1-flowered; sepals long-acuminate; lip without calli ..... *T. pergrata*
30' Inflorescence 2- to 3-flowered; sepals acuminate; lip with or without calli 31

31 Lip with a pair of thick calli ..... *T. semilunata*
31' Lip without calli 32

32 Lip oblong, obtuse ..... *T. jimburae*
32' Lip rhomboid, acute ..... *T. inaequisepala*

(*Ramicauls superposed*)

33 Plant small, caespitose, ramicauls with 2 or 3 superposed ramicauls.....34
33' Plant not primarily caespitose, ramicauls in elongated chains.....43

34 Lip trilobed with mammillate calli 35
34' Lip not trilobed with mammillate calli 37

35 Inflorescence to 5 cm, with 5 or more flowers.....*T. intricata*
35' Inflorescence to 2 cm, with 2-3 flowers 36

36 Ramicaul usually less than 1 cm long; sepals 4-5 mm long.....*T. pusilla*
36' Ramicaul 1-2 cm long; sepals striped, ca. 10 mm long.....*T. lenticularis*

37 Lip with a central callus 38
37' Lip 2 or 3 calli 39

38 Lip with low, central callus.....*T. membraniflora*
38' Lip with high, thick, basal callus .....*T. tropida*

39 Lip with a pair of central calli .....*T. wilhelmii*
39' Lip with 3 calli 40

40 Lip with 3 longitudinal calli .....*T. dura*
40' Lip with 3 short calli near the middle 41

41 Sepals not long-acuminate; lip with lateral calli thick.....*T. carinilabia*
41' Sepals long-acuminate; lip with lateral calli thin.....*T. todziae*

42 Plant shrub-like with branching ramicauls.....*T. amygdalodora*
42' Plant not shrub-like 43

43 Ramicauls above basal ramicaul mostly equal to or shorter than leaves.....44
43' Ramicauls above the basal ramicaul mostly longer than the leaves.....56

44 Leaves narrowly elliptical, 2-3 mm wide 45
44' Leaves elliptical to suborbicular 49

45 Leaves thick, terete 46
45' Leaves not terete 47

46 Raceme shorter than the leaf; lip deeply trilobed with midlobe papillose.....
.....*T. hirtzii*
46' Raceme longer than the leaf; lip shallowly trilobed with mammillate calli.....
.....*T. teres*

47 Leaves 1-1.5 cm long; lip trilobed with mammillate calli.....*T. solomonii*
47' Leaves 2-4 cm long; lip carinate, without mammillate calli.....48

48 Sepals ca. 7 mm long; lip with obtuse lobes near the middle.....*T. vagans*
48' Sepals ca. 14 mm long; lip with erect, round lobes above the base.....
.....*T. dunstervillei*

49 Leaves elliptical, at least 4 mm wide.....50
49' Leaves suborbicular 55

50 Lip trilobed below the middle 51
50' Lip not trilobed 53

51 Lip long-pubescent ..... *T. chaetoglossa*
51' Lip glabrous 52

52 Lip with the lobes low, obtuse; column not winged ..... *T. cedralensis*
52' Lip with the lobes tall, subacute; column winged ..... *T. acremona*

53 Lip oblong without callus ..... *T. parsonsii*
53' Lip oblong without longitudinal callus 54

54 Lip with pair of longitudinal calli ..... *T. arbuscula*
54' Lip with a tall longitudinal callus ..... *T. fruticosa*

55 Cauline sheaths microscopically scabrous; leaves not striped ..... *T. drosoides*
55' Cauline sheaths long-ciliate; leaves purple-striped ..... *T. macphersonii*

56 Plants robust, more than 15 cm tall with an elongate, basal ramicaul 57
56' Plants weak, scandent, long-proliferating 63

57 Lip oblong with longitudinal calli 58
57' Lip without longitudinal calli 61

58 Sepals long-acuminate; column with subquadrate apical wings 59
58' Sepals not long-acuminate; column with triangular apical wings 60

59 Sepals yellowish, 9-14 mm long ..... *T. arbuscula*
59' Sepals with prominent purple stripes, 21-27 mm long ..... *T. barbelifera*

60 Sepals ca. 20 mm long; lip subquadrate ..... *T. robledorum*
60' Sepals ca. 7 mm long; lip oblong ..... *T. alabastra*

61 Lip obscurely trilobed without mammillate calli ..... *T. atropurpurea*
61' Lip trilobed with mammillate calli 62

62 Leaves broadly elliptical, to 4 cm long ..... *T. notosibirica*
62' Leaves narrowly elliptical, to 1.5 cm long ..... *T. solomonii*

63 Lip trilobed 64
63' Lip oblong, entire 68

64 Lip trilobed above the middle, long-pubescent ..... *T. strumifera*
64' Lip trilobed below the middle, with mammillate calli, glabrous 65

65 Sepals spiculate; lip with a central cavity ..... *T. chamaelepanthes*
65' Sepals glabrous 66

66 Leaves ca. 5 mm long 67
66' Leaves 10 or more mm long ..... *T. notosibirica*

67 Sepals 2.5 mm long ..... *T. nana*
67' Sepals 5-10 mm long ..... *T. scabridula*

68 Lip tricarinate ..... *T. dura*
68' Lip channeled between longitudinal calli ..... *T. gentryi*

KEY TO THE SPECIES OF SUBGENUS *PSEUDOLEPANTHES*

1 Lateral sepals connate 2
1' Lateral sepals free 4

2 Petals with marginal appendages ..... *T. decorata*
2' Petals entire 3

3 Lip with the callus as broad as the blade ..... *T. calceolaris*
3' Lip with the blade broader than the callus ..... *T. zunagensis*

4 Petals with a basal angle or process 5
4' Petals entire 8

5 Petals with bilateral, acute, basal angles ..... *T. ramosii*
5' Petals with one basal angle or process 6

6 Petals with a descending, basal process ..... *T. ectopa*
6' Petals with a basal angle on the upper margin 7

7 Petals with an obtuse, basal angle on the upper margin ..... *T. bricenoënsis*
7' Petals with an uncinate process on the upper margin ..... *T. uvaria*

8 Petals spathulate ..... *T. spathulata*
8' Petals not spathulate 9

9 Petals broader than the sepals ..... *T. silverstonei*
9' Petals narrower than the sepals ..... *T. pseudolepanthes*

KEY TO THE SPECIES OF SUBGENUS *XENIA*

1 Plant ascending, ramicauls prolific ..... *T. lilliputalis*
1' Plant caespitose, ramicauls not prolific 2

2 Sepals acuminate-caudate 3
2' Sepals not acuminate-caudate 4

3 Petals caudate ..... *T. ballatrix*
3' Petals obtuse ..... *T. hypocrita*

4 Lip with acute, antrorse, lateral lobes ..... *T. escobarii*
4' Lip with thick, broadly obtuse, lateral lobes ..... *T. tenuiflora*

SPECIFIC EPITHETS ATTRIBUTED TO *TRICHOSALPINX*

Trichosalpinx acremona (Luer) Luer ..... Fig. 25.
Trichosalpinx acunae Luer = *Pleurothallis obliquipetala* Ames & C.Schweinf.
Trichosalpinx aequatorialis (Luer) Luer = **T. dirhamphis**
Trichosalpinx alabastra (Luer & Escobar) Luer ..... Fig 26.
Trichosalpinx amygdalodora (Kränzl.) Luer ..... Fig.27.
Trichosalpinx apoda (Garay & Dunsterville) Luer = **Lepanthopsis apoda** (Garay & Dunsterville) Luer
Trichosalpinx arbuscula (Lindl.) Luer ..... Fig. 28., 29.
Trichosalpinx arbusculoides (Hashimoto) Luer = **T. arbuscula**
Trichosalpinx atropurpurea Luer ..... Fig. 30.
Trichosalpinx bacillaris (Pabst) Luer = **Pleurothallis bacillaris** Pabst
Trichosalpinx ballatrix Luer & Escobar ..... Fig. 103.
Trichosalpinx barbelifera Luer & Vásquez ..... Fig. 31.
Trichosalpinx berlineri (Luer) Luer ..... Fig. 1.
Trichosalpinx bicolor (Barb.Rodr.) Luer = **Pleurothallis bicolor** Barb.Rodr.
Trichosalpinx blaisdellii (S.Wats.) Luer ..... Fig. 2.,3.,4.
Trichosalpinx bradei (Schltr.) Luer = **Pleurothallis bradei** Schltr.
Trichosalpinx brevispicata (C.Schweinf.) Luer = **T. quitensis**
Trichosalpinx bricenoënsis Luer & Escobar ..... Fig. 93.
Trichosalpinx calceolaris Luer & Escobar ..... Fig. 94.
Trichosalpinx carinifera (Barb.Rodr.) Luer = **Pleurothallis carinifera** Barb.Rodr.
Trichosalpinx carinilabia (Luer) Luer ..... Fig. 32.
Trichosalpinx castellensis (Brade) Luer = **Pleurothallis castellensis** Brade
Trichosalpinx caudata Luer & Escobar ..... Fig. 5.
Trichosalpinx cedralensis (Ames) Luer ..... Fig. 33.
Trichosalpinx chaetoglossa (Luer) Luer ..... Fig. 34.
Trichosalpinx chamaelepanthes (Rchb.f.) Luer ..... Fig. 35.,36.
Trichosalpinx ciliaris (Lindl.) Luer ..... Fig. 6
Trichosalpinx costata (Luer & Vásquez) Luer ..... Fig. 37.
Trichosalpinx crucilabia (Ames & Correll) Luer ..... Fig. 38.
Trichosalpinx cryptantha (Barb.Rodr.) Luer = **Pleurothallis cryptantha** Barb.Rodr.
Trichosalpinx curti-bradei (Pabst) Luer = **Pleurothallis curti bradei** Pabst
Trichosalpinx dalstroemii Luer ..... Fig. 39.
Trichosalpinx decorata Luer & Escobar ..... Fig. 95.
Trichosalpinx dependens (Luer) Luer ..... Fig. 7.,8.
Trichosalpinx dinotheri (Rchb.f.) Luer = **T. arbuscula**
Trichosalpinx dirhamphis (Luer) Luer ..... Fig. 40.
Trichosalpinx dithele Luer & Escobar = **T. semilunata**
Trichosalpinx dressleri Luer ..... Fig. 41.
Trichosalpinx drosoides Carnevali & Ramírez ..... Fig. 42.
Trichosalpinx dunstervillei Luer ..... Fig. 43.
Trichosalpinx dura (Lindl.) Luer ..... Fig. 44.,45.
Trichosalpinx ectopa Luer & Escobar ..... Fig. 96.
Trichosalpinx egleri (Pabst) Luer ..... Fig. 9.
Trichosalpinx escobarii Luer ..... Fig. 104.
Trichosalpinx falcipetala (Schltr.) Luer = **T. pergrata** ..... Fig. 70.
Trichosalpinx farrago Luer & Hirtz = **Lepanthopsis farrago** (Luer & Hirtz) Luer
Trichosalpinx fasciculata Luer ..... Fig. 46.
Trichosalpinx fissa Luer ..... Fig. 47.
Trichosalpinx foliata (Griseb.) Luer = **T. dura**
Trichosalpinx fruticosa Luer ..... Fig. 48.

Trichosalpinx gentryi Luer.....Fig. 49.
Trichosalpinx glabra D.E.Bennett & Christenson.....Fig. 10.
Trichosalpinx greenwoodiana Soto = **T. memor**
Trichosalpinx hamiltonii Luer.....Fig. 50
Trichosalpinx hirtzii Luer.....Fig. 51.
Trichosalpinx hypocrita (Garay & Dunsterv.) Luer.....Fig. 105.
Trichosalpinx inaequisepala (C.Schweinf.) Luer.....Fig. 52.
Trichosalpinx inquisiviënsis (Luer & Vásquez) Luer.....Fig. 11.
Trichosalpinx intricata (Lindl.) Luer.....Fig. 53.
Trichosalpinx jimburae Luer & Hirtz.....Fig. 54.
Trichosalpinx lamellata Luer & Hirtz.....Fig. 55.
Trichosalpinx lancifera (Schltr.) Luer = **T. orbicularis**
Trichosalpinx lankesteriana Luer = **T. blaisdellii**.....Fig. 4.
Trichosalpinx lenticularis (Luer) Luer.....Fig. 56.
Trichosalpinx lepanthoides (Schltr.) Luer = **T. arbuscula**
Trichosalpinx ligulata Luer & Hirtz.....Fig. 57.
Trichosalpinx lilliputalis (Luer & Hirtz) Luer.....Fig. 106.
Trichosalpinx macphersonii Luer.....Fig. 58.
Trichosalpinx mastophora (Luer & Vásquez) Luer = **T. notosibirica**.....Fig. 65.
Trichosalpinx matinhensis (Hoehne) Luer = **Pleurothallis matinhensis** Hoehne
Trichosalpinx membraniflora (C.Schweinf.) Luer.....Fig. 59.
Trichosalpinx memor (Rchb.f.) Luer.....Fig. 12.,13.,14.
Trichosalpinx metamorpha Luer.....Fig. 60.
Trichosalpinx microcharis (Schltr.) Luer = **T. chamaelepanthes**
Trichosalpinx microlepanthes (Griseb.) Luer = **Lepanthopsis microlepanthes** (Griseb.) Ames
Trichosalpinx minutipetala (Ames & C.Schweinf.) Luer = **T. memor**.....Fig. 13.
Trichosalpinx mirabilis (Schltr.) Luer & Toscano = **Pleurothallis mirabilis** Schltr.
Trichosalpinx miragliae (Leite) Luer & Toscano = **Pleurothallis miragliae** Leite
Trichosalpinx montana (Barb.Rodr.) Luer.....Fig. 61.
Trichosalpinx moschata (Rchb.f.) Luer = **T. arbuscula**.....Fig. 29.
Trichosalpinx mouraeoides (Hoehne) Luer = **Pleurothallis mouraeoides** Hoehne
Trichosalpinx multicuspidata (Rchb.f.) Luer.....Fig. 62.
Trichosalpinx nageliana Soto = **T. memor**.....Fig. 14.
Trichosalpinx nana (Ames & C.Schweinf.) Luer.....Fig. 63.
Trichosalpinx navarrensis (Ames) D.Retana & J.García Fig. 15.
Trichosalpinx notosibirica (Hashimoto) Luer.....Fig. 64.
Trichosalpinx nymphalis (Luer) Luer.....Fig. 66.
Trichosalpinx obliquipetala (Ames & C.Schweinf.) Luer = **Lepanthopsis obliquipetala** (Ames & C.Schweinf.) Luer
Trichosalpinx operculata (Luer) Luer = **T. rotundata**
Trichosalpinx orbicularis (Lindl.) Luer.....Fig. 16.
Trichosalpinx otarion (Luer) Luer.....Fig. 67.
Trichosalpinx oxychilos Carnevali & Romero = **T. orbicularis**
Trichosalpinx parsonsii Luer & Dod.....Fig. 68.
Trichosalpinx patula Luer.....Fig. 17.
Trichosalpinx pergrata (Ames) Luer.....Fig. 69.
Trichosalpinx pleurothalloides (Cogn.) Luer = **Pleurothallis pleurothalloides** Cogn.
Trichosalpinx podoglossa (Hoehne) Luer = **Pleurothallis podoglossa** Hoehne
Trichosalpinx pringlei (Schltr.) Luer.....Fig. 18.
Trichosalpinx pseudolepanthes Luer & Escobar.....Fig. 97.
Trichosalpinx psilantha Luer & Vásquez.....Fig. 19.
Trichosalpinx pterophora (Cogn.) Luer = **Pleurothallis pterophora** Cogn.

Trichosalpinx pumila (Luer) Luer ..... Fig. 71.
Trichosalpinx punctata (Lindl.) Luer = **Pleurothallis punctata** Lindl.
Trichosalpinx punctatifolia (Barb.Rodr.) Luer = **Pleurothallis punctata** Lindl.
Trichosalpinx pusilla (H.B.K.) Luer ..... Fig. 72.
Trichosalpinx pyxos (Luer & Escobar) Luer = **T. amygdalodora**
Trichosalpinx quadridentata (Barb.Rodr.) Luer = **Pleurothallis quadridentata** Barb.Rodr.
Trichosalpinx quartzicola (Barb.Rodr.) Luer = **T. dirhamphis**
Trichosalpinx quitensis (Rchb.f.) Luer ..... Fig. 73.
Trichosalpinx ramosii Luer ..... Fig. 98.
Trichosalpinx ringens Luer ..... Fig. 20.
Trichosalpinx robledorum (Luer & Escobar) Luer ..... Fig. 74.
Trichosalpinx roraimensis (Rolfe) Luer = **T. pusilla** (H.B.K.) Luer
Trichosalpinx rotundata (C.Schweinf.) Dressler ..... Fig. 21.
Trichosalpinx ruschii (Hoehne) Luer = **Pleurothallis ruschii** Hoehne
Trichosalpinx scabridula (Rolfe) Luer ..... Fig. 74.,75.
Trichosalpinx semilunata (Luer) Luer ..... Fig. 77.
Trichosalpinx silverstonei Luer ..... Fig. 99.
Trichosalpinx solomonii Luer ..... Fig. 78.
Trichosalpinx sordida (Kränzl.) Luer = **Pleurothallis sordida** Kränzl.
Trichosalpinx spathulata Luer ..... Fig. 100.
Trichosalpinx spathuliglossa (Hoehne) Luer = **Pleurothallis spathuliglossa** Hoehne
Trichosalpinx steyermarkii Luer ..... Fig. 79.
Trichosalpinx stictophylla (Schltr.) Luer = **Pleurothallis stictophylla** Schltr.
Trichosalpinx strumifera Luer & Hirtz ..... Fig. 80.
Trichosalpinx systremmata (Luer) Luer ..... Fig. 81.
Trichosalpinx tamayoana Soto = **T. blaisdellii** ..... Fig. 3.
Trichosalpinx tantilla (Luer) Luer ..... Fig. 82.
Trichosalpinx teagueii Luer ..... Fig. 83.
Trichosalpinx tenera (Barb.Rodr.) Luer = **Pleurothallis tenera** Barb.Rodr.
Trichosalpinx tenuiflora (Schltr.) Luer ..... Fig. 107.
Trichosalpinx tenuis (C.Schweinf.) Luer ..... Fig. 84.
Trichosalpinx teres Luer ..... Fig. 85.
Trichosalpinx todziae Luer ..... Fig. 86.
Trichosalpinx trachystoma (Schltr.) Luer ..... Fig. 22.
Trichosalpinx triangulipetala (Ames & Correll) Luer ..... Fig. 23.
Trichosalpinx trilobata (Fawc. & Rendle) Luer ..... Fig. 87.
Trichosalpinx tropida (Luer) Luer ..... Fig. 88.
Trichosalpinx uvaria Luer ..... Fig. 101.
Trichosalpinx vagans (Garay & Dunsterv.) Luer ..... Fig. 89.
Trichosalpinx vasquezii Luer ..... Fig. 24.
Trichosalpinx vertex Luer & Escobar = **T. tenuis**
Trichosalpinx violacea (Lem.) Luer = **Pleurothallis catharinensis** Cogn.
Trichosalpinx wacketii (Handro & Pabst) Luer = **Pleurothallis wacketii** Handro & Pabst
Trichosalpinx webbiae Luer & Escobar ..... Fig. 90.
Trichosalpinx wilhelmii Luer ..... Fig. 91.
Trichosalpinx xiphochila (Rchb.f.) Luer = **Platystele xiphochila** (Rchb.f.) Luer, comb. nov.
Trichosalpinx yanganensis (Luer) Luer ..... Fig. 92.
Trichosalpinx zephyrina (Rchb.f.) Luer = **Pleurothallis zephyrina** Rchb.f.
Trichosalpinx zunagensis Luer ..... Fig. 102.

SUBGENUS *TRICHOSALPINX*

Trichosalpinx berlineri (Luer) Luer, Phytologia 54: 394, 1983. Fig. 1.

Bas.: *Pleurothallis berlineri* Luer, Selbyana 3: 60, 1976.

Ety.: Named in honor of Benjamin C. Berliner M.D. of Bloomfield, CT, who collected this species.

Plant medium to large in size, epiphytic, caespitose, pendent; roots coarse. Ramicauls more or less arcuate, descending, slender, slightly flexuous, 5-15 cm long, enclosed by 7-14 lepanthiform sheaths with long, oblique, dilated, ciliate ostia. **Leaf** pendent, coriaceous, narrowly elliptical, acute, 6-13 cm long, 0.7-1.2 cm wide, cuneate below into a petiole ca. 1 cm long. **Inflorescence** a pendent, loose, subflexuous, flexible, distichous, simultaneously several-flowered raceme, 5-15 cm long, including the filiform peduncle 1-2 cm long, from near the apex of the ramicaul; floral bracts 3-4 mm long; pedicels 3-4 mm long; ovary 1.5 mm long; **sepals** yellow, tan or orange, suffused with rose or brown, glabrous except for the laterals being microscopically pubescent centrally, fleshy, especially toward the apices, more or less recurved, the dorsal sepal ovate, obtuse, 8-12 mm long, 2.5-3.5 mm wide, 3-veined, the lateral sepals connate to near the middle into an ovate, obtuse lamina, 7-10 mm long, 3.5-5 mm wide, 4-veined, forming a shallow mentum with the column-foot, microscopically pubescent centrally; **petals** translucent, entire, elliptical-triangular, acute to subacute, 2.5-3 mm long, 1 mm wide, 1-veined; **lip** yellow or green, entire, oblong-subpandurate, 2.3-2.5 mm long, 1-1.5 mm wide, with the apex rounded, the sides broadly rounded and more or less erect below the middle, the disc with a low, obtuse callus above the base, the base with a pair of lobules, delicately hinged between to the column-foot; **column** stout, 2-2.5 mm long, with broad, angled wings above the middle, dentate at the apex, the anther and the stigma ventral, the foot thick, 1 mm long.

ECUADOR: Prov. of Loja: epiphytic, ca. 12 km east of Loja, alt. 2500 m, *B. Berliner s.n.* (Holotype: SEL; Isotype: MO); cloud forest east of Yangana, alt. 2500 m, 22 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10817* (MO); Nudo de Sabanilla, above Yangana, alt. 2300-2500 m, 2 Apr. 1985, *G. Harling & L. Andersson 23515* (GB). Prov. of Napo: forested hill south of Lumbaqui, alt. 850 m, 10 Feb. 1986, *C. Luer, J. Luer, A. Hirtz, W. Flores & A. Embree 11764* (MO). Prov. of Zamora-Chinchipe: along Río Zamora west of Zamora, alt. 1500 m, 20 Feb. 1986, *C. Luer, J. Luer, A. Hirtz, W. Flores & A. Embree 11965* (MO); Cordillera del Condor, Nambija, alt. 1300 m, Feb. 1987, *A. Hirtz 3297* (MO); ridge west of Zumba, alt. 1800 m, 25 Jan. 1989, *S. Dalström & T. Höijer 1197* (MO).
VENEZUELA: Edo. Lara: Cerro Negro, cloud forest above Río Claro, alt. 1100 m, Parqué Yacambú, cloud forest, alt. 1500 m, *C. C. K. Dunsterville s.n.*; Edo. Táchira: road to La Florida, alt. 1500 m, July 1963, *C. C. K. Dunsterville 790*; Uribante, between La Siberia and Las Cuevas Represa, alt. 1100 m, 8 July 1983, *H. van der Werff & A. Gonzales 5087* (MO, VEN). Edo. Zulia: Sierra de Perij, cloud forest between Pichicacao and Colombian border, alt. 1500 m, *C. C. K. Dunsterville s.n.*.
PERU: without collection data, 10 Oct. 1993, *D. Bennett 5646* (MO). Dept. of Junín: Jauja, above Monobamba, alt. 1600 m, 10 Aug. 1992, *D. Bennett 6207* (MO).
BOLIVIA: Dept. of La Paz: Muñecas, epiphytic above Consata, alt. 1500 m, collected by R. Vásquez, J. Luer & C. Luer, 23 Jan. 1981, flowered in cultivation 9 Mar. 1981, *C. Luer 5972* (SEL); Nor Yungas, NW of San Pedro on road through Incahuara-Mejillones, alt. 1500 m, 12-14 Feb. 1983, *J. C. Solomon 9578* (MO).

This species is found relatively frequently in the Andes from Venezuela into Bolivia. Although no collection from Colombia has been seen, it certainly occurs there. The first known collection was made by Ben Berliner near the cold, windswept pass east of Loja, which is famous for its rich orchid flora.

Arching, flexuous ramicauls with alternating, long and conspicuous, lepanthiform sheaths bear narrow leaves that hang downward. The loose, simultaneously flowered inflorescence hangs limply beside the leaf, sometimes surpassing it in length. The flowers gape widely, usually with the thickened apices of the sepals recurved. The size of the yellowish flowers is variable. Plants from higher altitudes sometimes produce flowers twice as large as those from lower altitudes. The sepals are glabrous, and the proportionately small petals and lip are also glabrous.

Trichosalpinx berlineri is related to the sympatric *T. dependens* which sometimes appears very similar with pendent but shorter leaves and much shorter inflorescences. Except for their being ciliate, the flowers of some gaping variations of *T. dependens* are very similar to those of glabrous *T. berlineri*.

Trichosalpinx blaisdellii (S.Wats.) Luer, Phytologia 54: 394, 1983. Fig. 2.,3.,4.

Bas.: *Pleurothallis blaisdellii* S.Wats., Proc. Amer. Acad. Arts 23: 284, 1888.
Ety.: Named in honor of F. E. Blaisdell, companion of Sereno Watson, co-discoverer of this species.

Syn.: *Pleurothallis guatemalensis* Rolfe, ex sic. (K).

Syn.: *Pleurothallis peraltensis* Ames, Sched. Orchid. 6: 65, 1923.
Ety.: Named for the community of Peralta near which this species was collected.

Syn.: *Pleurothallis standleyi* Ames, Sched. Orchid. 9: 37, 1925.
Ety.: Named in honor of Paul C. Standley who collected this species.

Syn.: *Trichosalpinx tamayoana* Soto A., Orquidea (Mex.) 10: 264, 1987.
Ety.: Named in honor of Roberto Tamayo, who has worked extensively in Mexican orchids.

Syn.: *Trichosalpinx lankesteriana* Luer, Lindleyana 10: 120, 1995.
Ety.: Named in honor of Charles H. Lankester, whose garden has become the Lankester Botanical Garden, where this species is cultivated.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls erect, comparatively stout, 3-13 cm long, enclosed by 5-13 lepanthiform sheaths with oblique, dilated, ciliate ostia. **Leaf** erect, coriaceous, more or less suffused with purple, elliptical, acute to subacute, 3-6.5 cm long, 1-3 cm wide, cuneate below into a petiole 3-5 mm long. **Inflorescence** an erect, lax or subdense, simultaneously several-flowered raceme, 1.5-4 cm long, including the filiform peduncle 0.5-2 cm long, from near the apex of the ramicaul; floral bracts 1-2.5 mm long; pedicels 1.5-2 mm long; ovary 1 mm long; **sepals** rose-purple to red-brown, variously ciliate, fleshy, especially toward the apices, the dorsal sepal narrowly ovate, obtuse, 3.5-10 mm long, 1.5-3 mm wide, 3-veined, the lateral sepals connate to about the middle into an ovate, obtuse, recurved, bifid lamina, or forming a concave synsepal, 3.5-10 mm long, 2-4 mm wide, 4-veined together, forming a mentum with the column-foot; **petals** translucent, minutely denticulate to ciliate, elliptical-oblong, subacute or obtuse, 1.5-2.5 mm long, 0.4-1 mm wide, 1-veined; **lip** orange-brown to purple, ciliate, oblong, subpandurate to ovate, obtuse, 2.5-3.5 mm long, 0.75-1 mm wide, the sides thin, incurved below the middle, the disc with a low, longitudinal callus from the base and disappearing above the middle, the base with a pair of small, retrorse lobules, delicately hinged between to the column-foot; **column** stout, 1.75-3 mm long, longitudinally winged, irregularly denticulate at the apex, the anther and the stigma ventral, the foot thick, 1 mm long.

MEXICO: Edo. Vera Cruz: near Mirador, Feb. 1842, *F. Liebmann 7307 (orchid nr. 134)* (C). Edo. Chiapas: Cerro Pinola, alt. 4000 ft., *T. M. MacDougall D322* (AMES). Edo. Morelia: Cuernacava, southwest of Chilpancingo, alt. 1700 m, 1932, *O. Nagel 3862A* (AMES); Teotepec, Mt. Piloncillo, alt. 1200 m, 10 Jan. 1933, *O. Nagel 1906* (AMES); Teotepec, Plan del Carrizo, alt. 1000 m, *O. Nagel 2017* (AMES). Edo. Vera Cruz: Orizaba, Apr. 1855, *Botteri 912* (K); north of Orizaba, alt 1200 m, 1 Jan. 1934, *O. Nagel 3345* (AMES). Edo. Sinaloa: km 223 between Durango and Mazatlán, near Botrerillos, alt. 1350 m, 30 Apr. 1986, flowered in cultivation 23 July 1986, *M. A. Soto Arenas & G. Salazar 2125* (holotype of *T. tamayoana*: AMO; isotype: MO). Without locality, received from E. Hagsater in 1975, flowered in cultivation, *E. Hagsater 2336* (SEL), C. Luer illustr. 689; without locality, received from E. Hagsater in 1975, flowered in cultivation, *E. Hagsater 4465* (SEL), C. Luer illustr. 011.
GUATEMALA: Without locality, "h. Houtt. Gand," 1848, *H. Kegel s.n.* (W). Without locality, 28 Apr. 1882, *F. C. Lehmann 4381* (G). Dept. of Alta Verapaz: Chocón forests, collected in 1885, flowered in cultivation at Cambridge, Nov. 1887, *S. Watson & F. Blaisdell s.n.* (Holotype: AMES, Isotype: K); road to Sebol, alt. 975 m, flowered in cultivation 20 Feb. 1981, *M. Dix 800* (SEL), C. Luer illustr. 5850; collected near Cobán, flowered in cultivation by O. Mittlestaedt in Cobán, 27 Nov. 1990, *C. Luer 14839* (MO); collected near Cubilquitz, flowered in cultivation by O. Mittlestaedt in Cobán, 13 Feb. 1990, *C. Luer 14597* (MO). Dept. of Suchitepequez: "Patulul," alt. 350 m, collected by Dr. Cesar Solano, flowered in cultivation by O. Tinschert, 18 Feb. 1981, *C. Luer 5844* (SEL). Dept. of Santa Rosa, alt. 4000 ft., Oct. 1893, *Heyde & Lux 6248* (BR). Dept. of Chimaltenango: Pacaya, 30 Nov. 1938, *J. R. Johnston 1405* (AMES). Without collection data, imported with *Odontoglossum grande*, flowered at Glasnevin, Oct. 1892, *F. W. Moore s.n.* (*P. guatemalensis*: K). Without locality, collected and flowered in cultivation in Guatemala by Peter Meng, 20 Feb. 1981, *C. Luer 5848* (SEL).
BELIZE: Mullins River road, alt. 150 ft., 20 Feb. 1929, *W. A. Schipp 542* (AMES); Camp 32B, alt. 2100 ft., 7 Mar. 1934, *W. A. Schipp 5840* (AMES); Stann Creek district, Middlesex, 24 Oct. 1939, *P. H. Gentle 3059* (AMES); Cayo district, Mt. Pine Ridge, alt. 1000 m, 26 Jan. 1980, *B. R. Adams 225* (AMES, K).
HONDURAS: Prov. of Atlantida: near Tela, Lancetilla Valley, 11 Mar. 1923, *O. Ames II 173* (AMES). Prov. of Comayagua: Pita Sola Lake, Yojoa, alt. 2000 ft., 25 Aug. 1932, *J. B. Edwards 92* (AMES). Prov. of Cortes: Santa Cruz de Yojoa, alt. 2000 ft., 29 Nov. 1933, *J. B. Edwarsd 67, 548, 580, 594* (AMES). Dept. de Olancho, arroyadas del río Wampú, alt. 500-700 m, 12-17 Mar. 1972, *C. Nelson & A. Clewell 0434* (MO).

EL SALVADOR: Laguna de Las Ninfas, alt. 1700 m, *F. Hamer 106* (MO); Boquerón San Salvador, alt. 1800 m, 21 Jan. 1974, *F. Hamer 365* (AMES). Cerro El Pilón, alt. 1600 m, *F. Hamer s.n.*
NICARAGUA: Prov. of Granada: Volcán Mombacho, alt. 1050 m, *A. Heller 2965* (SEL). Prov. of Jinotega: Macizos de Peñas Blancas, alt. 1000-1200 m, *A. Heller 7140* (SEL); Finca Hamonia, alt. 1050 m, *A. Heller 3311* (SEL). Prov. of Matagalpa: northeast of Matagalpa, alt. 1000 m, *L. O. Williams, Molina et al. 23853* (EAP, F, SEL). Prov. of Nueva Segovia: Jalapa, Río Arenal de Yalí, *J. Atwood, S. Marshall & D. Neill 6787* (F, MO), *6795* (AMES). Prov. of Zelaya: west of Bonanza, 7 Jan. 1974, *J. Atwood & D. Neill 7004* (AMES, MO); Cerro Kana Copema, east of Siuna, alt. 250 m, *D. Neill 4503* (MO, SEL); along new road to Mina Nueva América, *W. D. Stevens 8367* (MO).
COSTA RICA: Prov. of Alajuela: Rincón de la Vieja, alt. 700 m, 15 Aug. 1978, *C. Todzia 363, 398* (CR). Prov. of Cartago: Taburcia, Candelaria, ca. 1867, *A. Endres s.n.* (W); Peralta, alt. 2500 feet, 13 July 1923, *C. H. Lankester 484* (holotype of *P. peraltensis*: AMES): Río Taragu, between San Cristóbal and Santa Maria, *A. Endres s.n.* (W); El Muñeco, south of Navarro, alt. 1400 m, 8 Feb. 1924, *P. C. Standley 33607* (holotype of *P. standleyi*: AMES; isotype: US). Prov. of Guanacaste: Tilarán, San Pedro de Río Chiquito, alt. 1000 m, 1 June 1987, *W. Haber & E. Bello 7193* (CR, MO). Prov. of Heredia: La Selva, near junction of Puerto Viejo and Sarapiquí rivers, alt. 40-100 m, 19 Mar. 1921, *K. Richardson 123B* (ALTA, CR); Magsasay, road to Río Guácimo, alt. ca. 400 m, 15 Jan. 1983, *I. A. Chacón 97* (CR, MO); Braulio Carrillo, Terciopelo trail, 29 Mar. 1991, *K. Richardson 182* (ALTA, CR); Copalchí, alt. 1800 m, flowered in cultivation, Lankester Bot. Gard., 18 Mar. 1995, *C. Luer 17413* (MO). Prov. of Puntarenas: Monteverde, Río Guacimal, alt. 1000 m, 19 Feb. 1988, *W. Haber & E. Bello 8268* (CR, MO); Monteverde, alt. 1450 m, 16 Mar. 1989, *J. Atwood 89-84* (CR, SEL). Prov. of San José: Sta. Maria de Dota, *H. E. Stork 1209a* (AMES); same area, alt. 1500-1800 m, 26 Dec. 1925, *P. C. Standley & J. Valerio 43320* (AMES); vicinity of El General, alt. 850 m, Jan. 1936, *A. F. Skutch 2392* (AMES); Finca Hermógenes Pereira between Fila Dimat and Río Uren, 22 Oct. 1985, *L. D. Gómez, G. Herrera & D. Masterson 23757* (MO); Parqué Nacional Braulio Carillo, along Sendero La Botella, alt. 750 m, 21 Sept. 1990, *S. Ingram & K. Farrell 560* (CR, MO, SEL, USJ); Nicoya Peninsula, Cabo Blanco Nature Reserve, 0-200 m, Dec. 1969, *W. C. Burger & R. Liesner 6637* (CR, F); Peninsula de Osa, Ganado de Sierpe, alt. 10-50 m, collected by J. Lewis, 27 Oct. 1979, *C. Todzia 977* (CR). Without locality, *A. Endres 314* (W). Without collection data, flowered in cultivation at the Lankester Botanical Garden, Cartago, 18 Mar. 1995, *C. Luer 17411* (holotype of *T. lankesteriana*: CR; isotype: MO).
PANAMA: Prov. of Chiriquí: Bajo Chorro, alt. 1800 m, *Davidson 169* (AMES); without locality, alt. 1200 m, *C. W. Powell 424* (AMES); Mata Frances, collected by H. Butcher, flowered in cultivation by P. Jesup, 17 Oct. 1975, *C. Luer 1188* (SEL). Prov. of Darién: Jacqué Valley, *K. Reading s.n.* (MO). Prov. of Panama: Llano-Carti road, alt. 300-500 m, *C. Todzia & R. & K. Dressler 1020* (CR).

This taxon, treated here as a species-complex, or a super-species, is frequent and morphologically variable throughout Middle America from Mexico to the Darien of Panama. It was first collected and illustrated by Endres in Costa Rica around 1867. He sent illustrations and specimens to Reichenbach 30 years before the species was collected in Guatemala and published by Sereno Watson.

Trichosalpinx blaisdellii is closely related to *T. ciliaris*, with which it often grows in Mexico and Guatemala. The latter is distinguished by the slender, more or less flexuous ramicaul and narrower leaves. The former is also closely related to *T. orbicularis* with which it grows at the other end of Central America and Panama. Specimens intermediate between *T. blaisdellii* and *T. ciliaris*, and specimens intermediate between *T. blaisdellii* and *T. orbicularis* have been seen. Numerous vegetative and floral variations are found in populations throughout the distribution of *T. blaisdellii*. No two populations are alike.

The complex is characterized by a relatively stout, more or less erect ramicaul and an elliptical leaf, either narrow or broad. The short, congested inflorescence is shorter than the leaf. The sepals are variously ciliate, occasionally glabrous (*T. tamayoana*, Fig. 3.). The connivent lateral sepals recurve in various degrees. As in many species of pleurothallids, populations with "giant" flowers sometimes occur. Sepals vary in length from three millimeters to as long as ten millimeters, without significant morphological differences. A distinctive large variation was recognized as *T. lankesteriana*, Fig. 4. The petals are variously ciliate. The lip is oblong, obtuse or rounded at the apex, with ciliate margins, and with a low, rounded, more or less cellular callus at the base. A pair of small, retrorse, membranous basal lobules is present. The apex of the column is irregularly fringed.

Trichosalpinx caudata Luer & Escobar, sp. nov. Fig. 5.

Ety.: From the Latin *caudatus*, "caudate," referring to the tails of the lateral sepals.

Species haec *T. orbicularis* (Lindl.) Luer affinis, sed sepalo dorsali longiattenuato, sepalis lateralibus longiacuminatis ad medium connatis cum caudae semiteretibus apicibus divergentibus differt.

Plant small to medium in size, epiphytic, caespitose; roots slender. Ramicauls comparatively stout, erect, 2-8 cm long, enclosed by 2-8 minutely but coarsely ciliate, lepanthiform sheaths. **Leaf** erect, coriaceous, more or less suffused with purple beneath, broadly elliptical-ovate, subacute to obtuse, 1.5-4.5 cm long, 1-2.5 cm wide, abruptly contracted below into a petiole 1-2 mm long. **Inflorescence** a congested, secund, simultaneously few-flowered raceme, 4-7 mm long, including the filiform peduncle 3-5 mm long, borne behind the base of the leaf, from near the apex of the ramicaul; floral bracts 1-2 mm long; pedicels 1-1.5 mm long; ovary 0.75-1 mm long; **sepals** rose, white toward the bases, yellow toward the apices, glabrous, the dorsal sepal narrowly ovate, acute, attenuate, 7.5-8 mm long, 1.5-2 mm wide, 3-veined, the lateral sepals connate to near the middle into an ovate, acuminate, bifid lamina, concave at the base, forming a shallow mentum with the column-foot, 8 mm long, 2-3 mm wide above the base, 4-veined, the apices long-attenuate, thick, semiterete, obtuse, diverging; **petals** thinly membranous, translucent, oblong, 1.5-2.5 mm long, 0.5-1 mm wide, 1-veined, the apex acute, fimbriate; **lip** yellow, with purple margins, ciliate, narrowly triangular, acute, 2.5-3 mm long, 0.5-0.75 mm wide, the disc with a low, longitudinal callus from the base to near the middle, the base with a pair of minute lobules, delicately hinged between to the column-foot; **column** white, suffused with purple, stout, 2 mm long, longitudinally winged, with the apex irregularly dentate-fimbriate, the anther and the stigma ventral, the foot 1 mm long.

COLOMBIA: Dept. of Antioquia: La Tebaida, collected by E. Valencia, July 1988, flowered in cultivation at Colomborquídeas, 16 May 1993, *C. Luer 16907* (Holotype: MO). Dept. of Chocó: Bahia Solano, flowered in cultivation by M. & O. Robledo at La Ceja, 19 Mar. 1989, *C. Luer 14293* (MO).
PANAMA: Prov. of Chiriquí: San Vicente, alt. ca. 500 m, Sept. 1976, *C. Luer & H. Butcher 1246* (SEL).

Although little more than a geographical variation of the widely distributed and variable *T. orbicularis*, this taxon is recognized here because the long-caudate lateral sepals are very distinct. In Colombia it is known as "colas largas." Not found within in the eastern distribution of *T. orbicularis*, in Colombia and Panama it occurs within the distribution of *T. orbicularis*, from which it is indistinguishable vegetatively.

The sepals of *T. caudata* are longer than those of typical *T. orbicularis*, the laterals being acuminate into long, thick, semiterete tails that diverge toward the apices. The more or less ovate, concave, lateral sepals of *T. orbicularis* are more or less thickened above the middle throughout its range, but far from the extreme variation seen in this taxon. The fringed petals, narrowly acute lip and fimbriate column of the two taxa are similar.

Trichosalpinx ciliaris (Lindl.) Luer, Phytologia 54: 395, 1983. Fig. 6.

Bas.: *Specklinia ciliaris* Lindl., Edwards' Bot. Reg. 24: misc. 31, April 1838.
Ety.: From the Latin *ciliaris*, "ciliate," in reference to the floral parts.

Syn.: *Pleurothallis lepanthiformis* Rchb.f., Linnaea 18: 398, 1844.
Ety.: Named for the similarity of the plant to a species of *Lepanthes*.

Syn.: *Humboldtia lepanthiformis* (Rchb.f.) Kuntze, Rev. Gen. Pl. 2: 668, 1891.

Syn.: *Pleurothallis purpusii* Schltr., Orchis 9: 49, 1915.
Ety.: Named in honor of Carl A. Purpus, German traveler, who collected this species.

Syn.: *Pleurothallis ciliaris* (Lindl.) L.O.Williams, Caldasia 5: 14, 1942.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect, slender, more or less flexuous at nodes along the ramicaul, 3-6 cm long, enclosed by 4-8 lepanthiform sheaths with oblique, dilated, ciliate ostia. **Leaf** erect, coriaceous, more or less suffused with purple, narrowly elliptical, acute, 2-5.5 cm long, 0.5-1.1 cm wide, cuneate below into a petiole 3-4 mm long. **Inflorescence** an erect, dense to

subdense, distichous, simultaneously several-flowered raceme, 1-2.5 cm long including the filiform peduncle 0.5-1 cm long, from near the apex of the ramicaul; floral bracts 1 mm long; pedicels 1 mm long; ovary 0.5 mm long; **sepals** rosy, white toward the base, ciliate, fleshy, the dorsal sepal elliptical-ovate, acute to obtuse, 3-4.5 mm long, 1.25-2 mm wide, 3-veined, the lateral sepals connate to about the middle into an ovate, obtuse, more or less recurved, bifid lamina, 3.25-3.5 mm long, 2-3 mm wide, 4-veined together, forming a mentum with the column-foot; **petals** translucent, suffused with purple, minutely ciliate, elliptical-oblong, subacute to obtuse, 1.5-1.75 mm long, 0.3-0.75 mm wide, 1-veined; **lip** purple, ciliate, oblong, obtuse, 2 mm long, 0.5-1 mm wide, the sides thin, incurved below the middle, the disc with a longitudinal callus, subconical at the base, decreasing in height to near the middle where it forks into two low, indistinct calli, the base with a pair of small, retrorse lobules, delicately hinged between to the column-foot; **column** stout, 1.75-2 mm long, longitudinally winged, irregularly denticulate at the apex, the anther and the stigma ventral, the foot thick, 1 mm long.

MEXICO: Without locality, imported without collection data, Mar. 1838, *Loddiges s.n.* (Holotype: K). Edo. Vera Cruz: near Mirador, Apr. 1841, *F. Liebmann 7306 (orchid no. 130,131)* (C); *F. Liebmann 7308 (orchid no. 131b)* (C). Edo. Chiapas: El Real east of Ocosingo, 14 July 1954, *R. L. Dressler 1413* (AMES); Monte Líbano, east of Ocosingo, 16 July 1954, *R. L. Dressler 1424* (AMES); near Laguna Ocotal Grande southeast of Cerro Líbano, alt. 950 m, 2 Aug. 1954, *R. L. Dressler 1568* (AMES). Edo. Colina: Volcán Colina, near Hda. San Antonio, alt. 900 m, 15 Sept. 1934, *O. Nagel 4023* (AMES). Edo. Guerrero: San Vicente toward Mt. Peineta, north of Atoyac, alt. 1000 m, 10 Jan. 1933, *O. Nagel 2020A* (AMES). Edo. Oaxaca: below Plum. Hidalgo, alt. 1000 m, 17 Sept. 1936, *O. Nagel 6068* (AMES). Edo. San Luis Potosí: near Micos, alt. 760 m, 24 Mar. 1935, *O. Nagel 4820* (AMES). Edo. Vera Cruz: Zacuapán, alt. 400 m, Feb. 1922, *J. A. Purpus 88* (HBG); near Córdoba, alt. 800 m, 12 Mar. 1935, *O. Nagel 4594* (AMES); near Alma Longa east of Jalapa, alt. 850 m, 26 Oct. 1936, *O. Nagel 4702* (AMES); Near Zacuapán, collected by C. A. Purpus, 1912, flowered in cultivation in the Darmstadt Botanical Garden, 1913, *J. A. Purpus s.n.* (holotype of *P. purpusii* presumably destroyed at B, lectotype here designated: *C. A. Purpus 7712*, Mar. 1914, UC); Zacuapán, El Mirador, alt. 900 m, 30 June 1933, *C. A. Purpus 2464* (AMES). Without locality, *Leibold 2223* (holotype of *P. lepanthiformis*: W; isotype: AMES). .
GUATEMALA: Dept. of Alta Verapaz: "Anonas," Salamá, Union Barrios, alt. 6500 ft., flowered in cultivation by O. Mittlestaedt in Cobán, 13 Feb. 1990, *C. Luer 14598* (MO). Dept. of Izabal: vicinity of Quiriguá, alt. 75-225 m, 15 May 1922, *P. C. Standley 23901* (AMES); Los Andes district, alt. 15 ft., 8 Apr. 1935, *M. W. Lewis 42* (AMES).
BELIZE: Toledo district, Blue Creek, alt. 30 m, 2 Apr. 1979, *J. Briggs & B. R. Adams B14* (K).
HONDURAS: Prov. of Atlantida: La Fragua, 7 Feb. 1928, *P. C. Standley 55723* (AMES). Prov. of Comayagua: Coyocutena, San Luis, alt. 4000 ft., 25 May 1932, *J. B. Edwards 172* (AMES); Malcotal, San Luis, 14 June 1932, *J. B. Edwards 183* (AMES); La Libertad, alt. 2500 ft., 27 June 1933, *J. B. Edwards 440* (AMES). Prov. of Cortes: Santa Cruz de Yojoa, alt. 2000 ft., 23 Aug. 1933, *J. B. Edwards 503* (AMES).
NICARAGUA: Prov. of Jinotega: Macizos de Peñas Blancas, alt. 1300 m, *A. Heller 8811* (SEL).
COSTA RICA: Prov. of Cartago: Peralta, May 1925, *C. H. Lankester 986* (AMES). Prov. of Limón: Río Reventazón below Cairo, alt. 55 m, 19 Feb. 1926, *P. C. Standley & J. Valerio 48710, 48897* (AMES).

This species is little more than a weak, vegetative form of the widely distributed, pleomorphic *T. blaisdellii*. The small, narrowly elliptical leaves are borne by a slender, more or less flexuous ramicaul. The small, purplish flowers are produced in a short, distichous raceme. The sepals and petals are ciliate, similar to those of *T. blaisdellii*. The lip is ciliate and oblong, not necessarily only twice as long as wide (Soto, 1987). It is thrice longer than wide in Lindley's sketch of the type. The conical callus at the base is more similar to that of *T. memor* than the low, longitudinal callus of *T. blaisdellii*. The callus can also be seen to fork occasionally near the middle, but this feature is often obscure. An illustration of *T. memor* was inadvertently substituted for *T. ciliaris* in *Icones Pleurothallidinarum I*, Plate 27.

In his *Folia Orchidacea Pleurothallis*, Lindley equated his *Specklinia ciliaris* with Knowles & Westcott's *Pleurothallis villosa*. The type-specimen of *P. villosa* is apparently nonextant, but the published, explicit description in the *Floral Cabinet* certainly applies to what is commonly known today as *P. hirsuta* Ames. Reasons for earlier interpretations by different authors are difficult to comprehend. They may be simply first or borrowed impressions that were never addressed again.

Trichosalpinx dependens (Luer) Luer, Phytologia 54: 395, 1983. Fig. 7.,8.

Bas.: *Pleurothallis dependens* Luer, Selbyana 3: 94, 1976.

Ety.: From the Latin *dependens*, "hanging down," in reference to the habit.

Syn.: *Pleurothallis flexibilis* Luer & Vásquez, Phytologia 49: 205, 1981.

Ety.: From the Latin *flexibilis*, "flexible," in reference to the weak, flexible ramicauls.

Syn.: *Trichosalpinx flexibilis* (Luer & Vásquez) Luer, Phytologia 54: 395, 1983.

Plant small to medium in size, epiphytic, caespitose, more or less pendent to suberect; roots slender. Ramicauls ascending to pendent, slender, more or less flexuous, 3-15 cm long, enclosed by 5-13 lepanthiform sheaths with long, oblique, dilated, ciliate ostia. **Leaf** suberect or pendent, coriaceous, elliptical to narrowly elliptical, acute, 3-9 cm long, 1-2.7 cm wide, cuneate below into a petiole 1-3 mm long. **Inflorescence** a congested, distichous, simultaneously few- to several-flowered raceme, 1-3 cm long, including the filiform peduncle 0.5-2 cm long, from near the apex of the ramicaul; floral bracts 1-2 mm long; pedicels 1-2 mm long; ovary 0.5-1.75 mm long; **sepals** red-brown to purple, ciliate, fleshy, especially toward the apices, the dorsal sepal ovate, obtuse, 2.25-5 mm long, 1.5-2 mm wide, 3-veined, the lateral sepals connate to about the middle into an ovate, obtuse, concave synsepal, 2.25-5 mm long, 2-4 mm wide expanded, 4-veined, forming a mentum with the column-foot; **petals** translucent, ciliate-denticulate, elliptical-oblong, subacute or obtuse, 1-2 mm long, 0.5-1 mm wide, 1-veined; **lip** dark brown or purple, ciliate to long-ciliate, oblong to obovate or pyriform, 1.5-2 mm long, 0.5-0.8 mm wide, with the apex rounded, the sides thin, slightly incurved below the middle, the disc with a low, rounded callus above the base, the base with a pair of comparatively large, diverging lobules, delicately hinged between to the column-foot; **column** stout, 1.5 mm long, with broad, angled wings above the middle, bidentate at the apex, the anther and the stigma ventral, the foot thick, 0.5 mm long.

ECUADOR: Prov. of Tungurahua: epiphytic on lower slopes of Volcán Tungurahua, alt. ca. 2000 m, flowered in cultivation in Puyo by *J. Brenner 22* (Holotype: SEL), C. Luer illustr. 250. Prov. of Sucumbíos: between La Bonita and Rosa Florida, alt. 1400 m, *S. Dalström, S. Ingram & K. Ferrell-Ingram 2144* (MO). Prov. of Morona-Santiago: north of Gualaquiza, July 1975, *C. Luer, G. Luer & S. Wilhelm 611* (SEL); same area, alt. 1500 m, 27 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10975* (MO); same area, alt. 1600 m, 17 May 1988, *C. Luer, A. Hirtz, W. Flores, A. Andreetta & W. Teague 13419* (MO); new road west of Macas to Guamote, alt. 1900 m, 16 Jan. 1989, *C. Luer, J. Luer, P. Jesup, A. Jesup, A. Hirtz & S. Ortega 13939* (MO); epiphytic in wet forest 3 km north of Macas, alt. 1050 m, 15 Jan. 1989, *C. Luer, J. Luer, P. Jesup, A. Jesup, A. Hirtz & S. Ortega 13899, 13907* (MO); Cordillera del Cutucú, between Mendez and Morona, alt. 950 m, 17 Jan. 1989, *C. Luer, J. Luer, P. Jesup, A. Jesup, A. Hirtz & S. Ortega 13970, 14001* (MO). Prov. of Napo: south of Tena, July 1975, flowered in cultivation at SEL, 1976, *C. Luer, G. Luer & S. Wilhelm 1278* (SEL); Reventador, alt. 1600 m, 5 Oct. 1984, *A. Hirtz & A. Andreetta 1977* (MO); epiphytic in wet forest around the Bermejo oil fields north of Lumbaqui, alt. 850 m, 6 Feb. 1986, *C. Luer, J. Luer, A. Hirtz, W. Flores & A. Embree 11729* (MO); Hollin Loreto, alt. 1000 m, Nov. 1988, *A. Hirtz 3926* (MO); northeast of El Chaco, alt. 1900 m, 15 Feb. 1990, *S. Dalström & L. Årnby 1343* (MO); between Archidona and Coca, alt. 1000 m, 17 Feb. 1990, *S. Dalström & L. Årnby 1357* (MO). Prov. of Loja: between Cariamanga and Amaluza, alt. 2500 m, 20 Mar. 1984, *C. Luer, S. Dalström, T. Höijer & J. Kuijt 9630* (MO). Prov. of Zamora-Chinchipe: Cordillera del Condor, east of Mayaicu, alt. 1300 m, 20 May 1988, *C. Luer, A. Hirtz, W. Flores, A. Andreetta & W. Teague 13499* (MO); new road east of Paquisha, alt. 1200 m, 23 Jan. 1992, *C. Luer, J. Luer, P. Jesup, A. Jesup & A. Hirtz 16123* (MO); west of Zumba, alt. 1800 m, 25 Jan. 1989, *S. Dalström & T. Höijer 1196* (MO).

PERU: Dept. of Huancabamba: "Incerta de Portmana," Jan. 1883, *E. André 508* (K). Dept. of Amazonas: near Pedro Ruiz, alt. 1200 m, flowered in München by W. Kōniger, 30 Aug. 1984, *C. Luer 10430* (MO). Dept. of Cuzco: Urubamba, Machu Picchu, among rocks, alt. 2040 m, 16 May 1943, *C. Vargas 3406* (AMES), identified in *Orchids of Peru as P. ciliaris*; Quispicanchis, San Pedro-Murayaca Mascapata, alt. 1200-1800 m, 14 July 1945, *C. Vargas 5207* (AMES). Dept. of Junín: Tarma, Caserio Santa Rosa near Tarma, alt. 1800 m, 26 Dec. 1992, *D. Bennett 5927* (MO).

BOLIVIA: Dept. of Cochabamba: Chapare, epiphytic in rain forest along Río Evispas, alt. 500 m, 16 Jan. 1981, *C. Luer, J. Luer & R. Vásquez 5639* (holotype of *P. flexibilis*: SEL). Dept. of La Paz: Larecaja: Alto Llipe above Tipuani, collected Aug. 1991, flowered in cultivation in Quito, Ecuador, *A. Hirtz 5805* (MO); Nor Yungas, forest northeast of Caranavi, alt. 1550 m, 26 Jan. 1988, *C. Luer, J. Luer, R. Vásquez, J. Solomon, T. & D. Mulder & A. Vogel 12941* (MO); same area, alt. 1500 m, 31 Aug. 1991, *C. Luer, A. Hirtz, R. Vásquez et al. 15393* (MO).

COLOMBIA: Dept. Antioquia: Frontino, alt. 1800 m, Oct. 1891, *F. C. Lehmann 7055* (AMES, K). Montaña de Mismis, between Anserma and Lupis, alt. 1500-2000 m, July 1891, *F. C. Lehmann 7055* (K). Dept. of Cauca: above Popayán, alt. 1600-1800 m, *F. C. Lehmann B.T. 167, 246, 248* (AMES, K,

W). Dept. of Norte de Santander: above Sardinata, alt. 1750 m, 7 May 1982, *C. Luer, J. Luer, R. Escobar & E. Valencia 7767* (SEL).
VENEZUELA: Edo. Mérida: near Quebrada Los González, alt. ca. 1600 m, Oct. 1966, *G.C.K. Dunsterville 23*
FRENCH GUYANA: Saül, Crique Cochon, 31 Aug. 1986, *M. Freiberg 103* (B).

Trichosalpinx dependens, treated as a species-complex, is frequent and variable in its wide distribution through the Andes from the Guyanas through Venezuela and the Andes into central Bolivia. It is common on the eastern slopes of Ecuador, usually growing between 1000 and 2500 meters above sea level. It seems to be the austral counterpart of the Central American complex *T. blaisdellii*.

Most plants of *T. dependens* are pendent with the ramicauls more or less flexuous with conspicuous, elongated apices of distichous, lepanthiform sheaths, similar to those of the pendent *T. berlineri*. Some forms with shorter ramicauls grow more or less erect, especially in drier or more exposed habitats. The leaves vary in size and shape. The racemes are congested, distichous and much shorter than the leaf. Some flowers are very small with sepals barely over two millimeters in length, while others reach five millimeters.

Typically, the lateral sepals are partially connate and connivent into a concave synsepal (Fig. 7.) as seen in *T. memor*, but often the cavity is incomplete with more or less erect lateral sepals (Fig. 8.) that are thicker toward the apices. The petals are small and membranous with ciliate apices. The lip is ciliate and more or less oblong with the apex rounded. A low, rounded callus is at the base, flanked by a comparatively large pair of diverging lobules. The column is winged and bidentate at the apex, not fringed.

A similar, closely allied, sympatric taxon, *T. patula*, differs with more gaping flowers with decurved lateral sepals. It grades into the forms of *T. dependens* with less complete, concave synsepals. Distinction between the two taxa is often uncertain. A typical form of *T. dependens* illustrated in *Venezuelan Orchids Illustrated* as well as in the Field Guide (Dunsterville & Garay, 1979) is identified as *Pleurothallis memor*. A typical form of *T. patula* is identified as the Central American *P. blaisdellii*. An illustration of *P. memor* is identified as the Central American *P. ciliaris*. Most specimens cited from Peru as *P. ciliaris* are referable to either *T. dependens* or *T. memor*.

Trichosalpinx egleri (Pabst) Luer, Phytologia 54: 395, 1983. Fig. 9.

Bas.: *Pleurothallis egleri* Pabst, Ann. XIV Congr. Soc. Bot. Bras. 14, 1964.

Ety.: Named in honor of Walter Egler, former director of the Goeldi Museum, Belem, who discovered this species.

Plant small to medium in size, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 2-5 cm long, enclosed by 5-8 minutely ciliate, lepanthiform sheaths. **Leaf** erect, coriaceous, more or less suffused with purple beneath, elliptical, acute, 3-6 cm long, 1-1.5 cm wide, cuneate below into a petiole 3-5 mm long. **Inflorescence** a congested, distichous, successively few-flowered raceme, up to 1 cm long, borne behind the leaf by an erect, filiform peduncle 1-3 cm long, from near the apex of the ramicaul; floral bracts 1 mm long; pedicels 0.75-1 mm long; ovary 0.5-0.75 mm long; **sepals** variously suffused with purple, yellowish or green toward the base, glabrous, fleshy, the dorsal sepal ovate, subacute, 3.5-4 mm long, 1.5-2 mm wide, 3-veined, the lateral sepals approximate and recurved, connate to the middle or above into an ovate, concave, obtuse lamina, 3.5-4 mm long, 2 mm wide, 4-veined together, forming a mentum with the column-foot; **petals** translucent purple, oblong-triangular, oblique, acute, 2 mm long, 0.75-1 mm wide, 1-veined; **lip** dark purple, yellow toward the base, ciliate, oblong, obtuse to round at the apex, 2.5-3 mm long, 0.9-1 mm wide, the disc with a low, longitudinal callus, ending in a subconical callus above the base, the base with a pair of minute lobules, delicately hinged between to the column-foot; **column** white, stout, 2 mm long, with the apex irregularly denticulate, the anther and the stigma ventral, the foot thick, 1 mm long.

BRAZIL: Edo Pará: Alto Topojós, Río Cururu, 15 Feb. 1960, *W. Egler & Raimundo 1350* (Holotype: HB).
BOLIVIA: Dept. of Cochabamba: epiphytic in seasonally dry forest at Bulo-bulo, alt. 300 m, west of Yapacaní in the dept. of Santa Cruz, 22 Aug. 1991, *C. Luer, J. Luer, R. Vásquez & D. Ric 15342A* (MO).
PERU: Dept. of Pasco: Pasco, 30 km SW of Puerto Bermudez, alt. ca. 600 m, collected by S. Castro, *D. Bennett 4749* (MO) C. Luer illustr. 16631.
FRENCH GUYANA: epiphytic in tall rain forest, Piste St. Elie, alt. 100 m, 13 May 1986, *C. Luer, J. Luer & D. Barthelemy 12240* (MO).
GUYANA: Hood Road at Barima River, 26 Feb. - 11 Aug. 1896, *E. im Thurn 115B* (K); Essequibo River, Moraballi Creek near Bartica, near sea level, 6 Oct. 1929, *N. Y. Sandwith 384* (K); Savannah Briole, *G. R. M. Pollard 68* (K); Demirara, flowered in cultivation at Kew, June 1864, May 1872 *Drake s.n.* (K); Kaiteur Falls, 14 May 1944, *M. Maquire & D. B. Fanshawe 23445* (AMES, K); Kanuku Mts., alt. 960 m, 11 Nov. 1887, *M. J. Jansen-Jacobs et al. 858* (B).
SURINAME: Paramaribo, Mar. 1845, *Regel* (W). Without locality, collected by C. H. Dodson and J. Blaser, Dec. 1975, flowered in cultivation at SEL, 30 Jan. 1976, *C. Luer 010* (SEL).
VENEZUELA: Edo. Bolívar: Sierra Imataca, Río Toro between Río La Reforma and Puerto Rico north of El Palmar, alt. 200-250 m, 14 Dec. 1960, *J. A. Steyermark 88072* (VEN)
GRENADA: without locality, Oct.-May 1890-91, *R. V. Sherring s.n.* (BR); 14 Jan. 1891, *R. V. Sherring 286* (K); 30 Mar. 1897, *W. E. Broadway 1495* (BR); Mirabeau Mts., St. Davids', 1 May 1906, *W. E. Broadway 5082* (BR): Annandale, St. George's, *W. E. Broadway s.n.* (AMES); Azimar Mts., 18 Nov. 1905, *W. E. Broadway s.n.* (AMES); woods south of Grand Etang, 24 Feb. 1950, *R. A. Howard 10679* (AMES).

This species occurs at low altitudes of northern Brazil, the Guyanas, adjacent Venezuela and the nearby Antilles, and across the Amazon basin into Peru and Bolivia. It has been identified as either *Pleurothallis ciliaris* Lindl. or *P. villosa* Knowl. & West., both of which occur in northern Central America and Mexico. *Trichosalpinx egleri* most closely resembles the common and variable *T. blaisdellii* from Central America.

Trichosalpinx egleri is distinguished by the erect, strict, ramicauls with acute, elliptical leaves and short, congested, distichous racemes often produced from twice to thrice longer, slender, erect peduncles. The sepals are glabrous; the petals are triangular and acute; and the lip, nearly as long as the sepals, is oblong and ciliate with a low, longitudinal callus ending in a subconical callus at the base.

Trichosalpinx glabra D.E.Bennett & Christenson, Brittonia 46: 256, 1994. Fig. 10.

Ety.: From the Latin *glaber*, "glabrous," in reference to the lip.

Plant medium size, epiphytic, caespitose; roots slender. Ramicauls stout, slightly flexuous, to 5-6 cm long, enclosed by 5-6 lepanthiform sheaths with oblique, dilated, ciliate ostia. **Leaf** erect, coriaceous, elliptical, acute, 4.8 cm long, 1.4 cm wide, cuneate below into a short petiole. **Inflorescence** an erect, successively 2-flowered raceme, estimated 1 cm long, including the filiform peduncle ca. 1 cm long, from near the apex of the ramicaul; floral bracts not noted; pedicels not noted; ovary estimated 2 mm long; **sepals** sparsely ciliate, fleshy above the middle, the dorsal sepal translucent greenish, orange at the apex, oblong-ovate, obtuse, concave, 6.5 mm long, 3 mm wide, 3-veined, the lateral sepals dark purple, orange above the middle, connate to above the middle into an ovate, obtuse, concave, bifid lamina, 9 mm long, 7 mm wide, forming a mentum with the column-foot; **petals** translucent greenish, ciliate-denticulate, oblong, obtuse, 3 mm long, 1 mm wide, 1-veined; **lip** dark purple, yellow at the apex, glabrous, pandurate, 4 mm long, 1.8 mm wide, with the apex rounded, broadly angled below the middle, narrowed in basal third, the disc with a low, longitudinal callus from the base to near the apex, the base with a pair of diverging, lateral lobules, delicately hinged between to the column-foot; **column** stout, 3.5 mm long, with broad, angled wings above the middle, bidentate at the apex, the anther and the stigma ventral, the foot thick, 1 mm long.

PERU: Dept. of Junín: Tarma, Caserío Santa Rosa in District of Huasahuasi, altitude unknown, 28 Nov. 1992, *O. del Castillo ex Bennett 5927* (Holotype: USM).

This species is closely allied to the *T. dependens*-complex, but is distinguished by the glabrous lip. Apparently it is endemic in central Peru where it is known from only the original collection. It is characterized by a stout, slightly flexuous ramicaul with conspicuous, long-ciliate sheaths, and an elliptical leaf. The flowers are produced successively in a fascicle of short peduncles. In common with many other species the sepals are thickened above the middle. The lateral sepals are connate into a shallow synsepal that forms a mentum with the column-foot. The petals are ciliate-fimbriate. The lip is subpandurate with a broadly rounded apex, narrowed in the basal third, and with diverging basal lobules. The disc bears a low, longitudinal callus.

Trichosalpinx inquisiviënsis (Luer & Vásquez) Luer, Phytologia 54: 395, 1983.
Bas.: *Pleurothallis inquisiviënsis* Luer & Vásquez, Phytologia 49: 208, 1981. Fig. 11.
Ety.: Named for the province of Inquisivi, Bolivia, where the species was discovered.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls slender, erect to suberect, non-flexuous, 4-10 cm long, enclosed by 5-9 lepanthiform sheaths with broadly dilated, oblique, ciliate ostia. **Leaf** erect, coriaceous, suffused and veined in purple, broadly elliptical, obtuse, 3.5-5 cm long, 1.8-2.8 cm wide, contracted below into a petiole 5-6 mm long. **Inflorescence** a congested, successively 1- to 3-flowered raceme, up to 1 cm long, including the filiform peduncle 5 mm long, produced successively in a fascicle at the base of the backside of the leaf, from near the apex of the ramicaul; floral bracts 1.5-2 mm long; pedicels 3-4 mm long; ovary 1.5-2 mm long; **sepals** shortly ciliate, fleshy, the dorsal sepal yellow, ovate, subacute, 4 mm long, 2.5 mm wide, 3-veined, the lateral sepals connate to above the middle into a broadly ovate, concave, obtuse, bifid lamina, 4 mm long, 3.25 mm wide, 4-veined together, forming a mentum with the column-foot; **petals** translucent yellow with a purple midvein, oblong, long-ciliate at the subacute apex, 1.75 mm long, 1 mm wide, 1-veined; **lip** yellow with purple margins, long-ciliate above the middle, obovate, 2.5 mm long, 1 mm wide, with the apex rounded, the disc with a low, rounded callus above the base, disappearing near the middle of the lip, the base with a pair of lobules, delicately hinged between to the column-foot; **column** white, stout, 2 mm long, with the apex denticulate, the anther and the stigma ventral, the foot thick, 1 mm long.

BOLIVIA: Dept. of La Paz: Inquisivi, epiphytic in cloud forest between Inquisivi and Cirquata, alt. 2550 m, 28 Jan. 1981, *C. Luer, J. Luer & R. Vásquez 5805* (Holotype: SEL).

This species is apparently endemic at a relatively high altitude in northern Bolivia. It is within the *T. dependens*-complex, but it seems to differ sufficiently to maintain recognition. It is distinguished by the broadly elliptical, purplish leaves borne by relatively stout, straight ramicauls with conspicuously dilated apices of the sheaths. A single, small, yellow flower is produced successively in short racemes at the base of the backside of the leaf amid a fascicle of old, faded racemes. Similar to *T. dependens*, the sepals are shortly ciliate; the apices of the short petals are long-ciliate, and the apex of the obovate lip is also long-ciliate. A low callus at the base disappears above the middle of the lip.

Trichosalpinx memor (Rchb.f.) Luer, Phytologia 54: 396, 1983. Fig. 12.,13.,14.

Bas.: *Pleurothallis memor* Rchb.f., Bonplandia 4: 330, 1856.
Ety.: From the Latin *memor*, "mindful," in allusion to the affinity of *P. ciliaris*.

Syn.: *Humboldtia memor* (Rchb.f.) Kuntze, Rev. Gen. Pl. 2: 667, 1891.

Syn.: *Pleurothallis gnomonifera* Ames, Sched. Orchid. 6: 61, 1923.
Ety.: From the Greek *gnomon*, "a sundial pointer," and the Latin *-fer*, "bearing," in allusion to the callus of the lip.

Syn.: *Pleurothallis brevis* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 19: 183, 1923.
Ety.: From the Latin *brevis*, "short," referring to the habit.

Syn.: *Pleurothallis minutipetala* Ames & C.Schweinf., Sched. Orchid. 10: 32, 1930.
Ety.: From the Latin *minutipetalus*, "with a small petal," referring to the size of the petals.

Syn.: *Trichosalpinx minutipetala* (Ames & C.Schweinf.) Luer, Phytologia 54: 396, 1983.

Syn.: *Trichosalpinx nageliana* Soto A., Orquidea (Mex.) 10:259, 1987.
Ety.: Named in honor of Otto Nagel, well-known collector of Mexican orchids.

Syn.: *Trichosalpinx greenwoodiana* Soto, Orquidea (Mex.) 10: 257, 1987.
Ety.: Named in honor of Edward W. Greenwood, investigator of the orchids of Mexico.

Plant small to large in size, epiphytic, caespitose; roots slender. Ramicauls slender to relatively stout, erect, 2-12 cm long, enclosed by 4-10 lepanthiform sheaths with broadly dilated, oblique, ciliate ostia. **Leaf** erect, coriaceous, more or less suffused in purple beneath, sometimes convex, broadly to narrowly elliptical, acute, subacute to obtuse, 2.5-7.5 cm long, 1-2.8 cm wide, cuneate below into a petiole 5-8 mm long. **Inflorescence** a dense, distichous, simultaneously few- to several-flowered raceme, 1-3 cm long, including the filiform peduncle ca. 1 cm long, borne behind the leaf, from near the apex of the ramicaul; floral bracts 1.5-2.5 mm long; pedicels 2-2.5 mm long; ovary glabrous to minutely pubescent, 1-1.5 mm long; **sepals** cellular-glandular to shortly pubescent externally, sometimes glabrous, ciliate, fleshy, purple or yellow, more or less suffused with purple, the dorsal sepal ovate, subacute, 2.5-6 mm long, 1.75-3 mm wide, 3-veined, more or less pubescent within toward the apex, the lateral sepals connate to near the middle into a broadly ovate, more or less saccate, obtuse, shortly bifid lamina, 3-6 mm long, 2-4.5 mm wide, 4-veined together, forming a mentum with the column-foot; **petals** translucent yellow, more or less suffused with purple, oblong to suborbicular, obtuse, long- or short-ciliate, 0.5-1.75 mm long, 0.6-1.25 mm wide, 1-veined; **lip** dark purple, ciliate, oblong, obtuse, 1.8-3 mm long, 0.5-1.25 mm wide, the disc with central, longitudinal carina from the base, decreasing in height to near the middle where it parts into a pair of low, parallel calli above the middle, the base with a pair of minute lobules, delicately hinged between to the column-foot; **column** white, stout, 2-3 mm long, broadly winged above the middle, more or less bidentate at the apex with the apical margin between the teeth densely long-ciliate-fimbriate, the anther and the stigma ventral, the foot thick, 1 mm long.

COLOMBIA?: Without collection data, flowered in cultivation in the Hamburg Botanical Garden by Hofgartner *Forkel s.n.* (Holotype: W). Other collections not identified.
VENEZUELA: Edo. Bolívar: Auyan-tepui, alt. 1660 m, 12 May 1964, *J. A. Steyermark 93781* (AMES); Río Venamo, alt. 950-1000 m, 10 Jan. 1964, *J. A. Steyermark, G.C.K. & E. Dunsterville 92927* (AMES); Río Cuyuní south of El Dorado, alt. 1300 m, 22 Dec. 1970, *J. A. Steyermark 104259* (AMES, VEN); Meseta de Jaua, Cerro Jaua, alt. 1750 m, 22 Feb. 1974, *J. A. Steyermark et al. 109278* (AMES, VEN); Gran Sabana, north of Mision de Santa Teresita de Kavanayén, alt. 1250 m, 20 Feb. 1978, *J. Steyermark, V. Espinosa & G.C.K. Dunsterville 115513* (MO); Piar, Macizo del Chimantá, Amuri-tepui, alt. 1500 m, 2 Feb. 1983, *J. A. Steyermark, O. Huber & V. Carreño E. 128742* (MO, VEN). Edo. Mérida: Saltos de Río Gonzáles, alt. 1900-2100 m, 31 Aug. 1966, *J. A. Steyermark & M. Rabe 97038* (AMES); near El Puaji, Río Cabass, alt. 800-900 m, 3 Nov. 1985, *R. Liesner 19394* (MO). Edo. Sucre: Peninsula de Paria, Cagigal, alt. 850 m, 21 Feb. 1980, *J. Steyermark, R. Liesner & V. Espinosa 121507* (MO). Terr. Fed. Amazonas: Sierra Parima, alt. 1300 m, 18 May 1972, *J. A. Steyermark 105909* (AMES, VEN); Atabapo, Cerro Marahuaca, alt. 1225 m, 19 Feb. 1985, *R. Liesner 17693* (MO); same area, alt. 1000-1200 m, Oct. 1988, *R. Liesner 24951, 25401* (MO).
ECUADOR: Prov. of Carchi: between Maldonado and Chical, alt. 1400 m, 17 Mar. 1991, *C. Luer, J. Luer, A. Hirtz, X. Hirtz & J. Del Hierro 15112* (MO). Prov. of Morona-Santiago: Cordillera del Cutucú, east of Mendez, alt. 1000 m, 5 Feb. 1987, *C. Luer, J. Luer & A. Hirtz 12664* (MO); same area, alt. 950 m, 18 Jan. 1989, *C. Luer, J. Luer, P. Jesup, A. Jesup, A. Hirtz & S. Ortega 14002* (MO). Prov. of Napo: near Tena, July 1975, *C. Luer et al. 612* (SEL); same area, alt. 750 m, 14 Dec. 1976, *E. W. Davis 389* (AMES); between Cotundo and Coca, alt. 1100 m, 18 Nov. 1984, *A. Hirtz 2117* (MO). Prov. of Zamora-Chinchipe: Cordillera del Condor, east of Los Encuentros, alt. 1300 m, 19 May 1988, *C. Luer, A. Hirtz, W. Flores, A. Andreetta & W. Teague 13475* (MO).

PERU: Dept. of Junín: Chanchamayo, Hda. Santa Blanca, alt. 1450 m, between La Merced and Puente Colorado, date not known, *D. Bennett & A. Bennett 4755A* (USM).
BOLIVIA: Dept. of Cochabamba: Chapare, vicinity of Villa Tunari, collected by F. Fuchs et al., flowered in cultivation 4 July 1974, *C. Luer 612A* (SEL).
PANAMA: Prov. of Chiriquí: Cerro Norquita, alt. 5000-6000 ft., *C. W. Powell 311* (holotype of *P. gnomonifera*: AMES): Cerro Punta: toward headwaters of Río Caldera, alt. 2250-2500 m, *P. Allen 1466* (AMES); Cerro Homito, 16 Dec. 1976, *C. Luer, R. Dressler et al. 1362* (SEL); east of Fortuna camp site, alt. 1200-1600 m, 12 Sept. 1977, *J. P. Folsom, R. Dressler & K. Dressler 5326* (MO). Prov. of Panamá: Llano-Carti road, 3 Mar. 1976, *C. Luer, J. Luer, R. Dressler & P. Taylor 1075* (SEL); Cerro Jefe, alt. 850-900 m, 22 Nov. 1980, *K. Sytsma & T. Antonio 2355* (MO).
COSTA RICA: Without locality, *A. Endres 44* (W); Oct. 1923, flowered in cultivation at Kew 18 Feb. 1924, *C. H. Lankester s.n.* (AMES). Prov. of Alajuela: Bosque de Laguna, alt. 1190 m, 7 Nov. 1922, *A. M. Brenes (102)432* (holotype of *P. minutipetala*: AMES; isotype: CR); Quebrada Volio north of Balsa, alt. ca. 700-800 m, 29 Aug. 1979, *W. D. Stevens 13901* (MO); same area, alt. ca. 1050-1150 m, 10 Sept. 1979, *W. D. Stevens 14252* (MO). Prov. of Cartago: near Cartago, alt. 1450 m, Apr. 1922, *A. M. Brenes 276* (holotype of *P. brevis* presumably destroyed at B, lectotype: AMES, drawing). Prov. of Guanacaste: in pasture above Santa Elena, alt. 1600 m, 19 Mar. 1995, *C. Luer, J. Luer, J. Atwood & W. Rhodehamel 17428* (MO). Prov. of Heredia: Cerro Zurquí, alt. 1600 m, 13 Sept. 1978, *C. Todzia 444* (CR); Vara Blanca, collected 1979, flowered in cultivation, 15 Mar. 1980, *C. Luer 4291* (SEL); Monte de La Cruz, 2 Aug. 1982, *C. Todzia & R. Moran 2065* (CR); Magsasay, Río Guácimo, alt. ca. 400 m, 15 Jan. 1983, *I. A. Chacón 97* (CR). Prov. of Puntarenas: NE of Santa Elena, alt. 1550 m, 20 Nov. 1988, *W. Haber & W. Zuchowski 8824* (MO). Prov. of San José: epiphytic in forest above San Cristobal, alt. 1900 m, 22 Sept. 1979, *C. Luer, J. Luer, K. Walter 4293* (SEL); Parqué Nacional Baurilio Carillo, between Station Zurqui and Tajo Santa Cecilia, alt. 1750 m, 29 Oct. 1990, *S. Ingram & K. Farrell 646* (CR, MO, SEL, USJ).
NICARAGUA: Dept. of Matagalpa: north of Finca Hamonia, alt. 1260 m, *A. Heller 3337* (SEL).
GUATEMALA: Without locality, 1996, collected and cultivated by *M. Béhar s.n.* (MO).
MEXICO: Edo. Chiapas: Cerro Tres Picos, north of Tonolá, alt. ca. 2150 m, flowered in cultivation, 20 Oct. 1986, *Soto Arenas, E. Martínez & A. Mendoza 2763* (holotype of *T. greenwoodiana*: AMO). Edo. Guerrero: near Omiltemi, alt. ca. 1900 m, 7 July 1984, *M. A. Soto, J. Meave, L. M. Calvo & H. Paz 3075* (holotype of *T. nageliana*: AMO; isotype: MO). Edo. Veracruz: *McDiarmid s.n.* (SEL). Without locality, obtained from W. Bussey, cultivated by J & L Orchids, Easton, CT, *C. Luer 18497* (MO).
GRENADA: Annandale, St. George's Mts., *W. E. Broadway s.n.* (AMES); Azimar Mts. 18 Nov. 1905, *W. E. Broadway s.n.* (AMES); woods south of the Grand Etang, 24 Feb.-6 Mar. 1950, *R. A. Howard 10679* (AMES).
CUBA: Prov. of Las Villas: Lomas de Trinidad, Topes de Collantes, 1951, *W. Osment 18319* (AMES).

In common with some other taxa of this subgenus, this frequent species is variable with some local populations appearing distinct, but when they are compared to all the others, the distinctive characters are found scattered in the other populations. *Trichosalpinx memor* is treated here as a species-complex widely distributed in Central America from Mexico through Panamá and much of the Andes. Although the flowers vary little morphologically except for size, the taxon is especially variable vegetatively, and no doubt some subspecific taxa are being included. An attempt was made to recognize some taxa at the specific level, but too many intermediate variations exist.

A particularly large form described as *P. minutipetala* (Fig. 13.) and known from Costa Rica and western Panama, reaches 18 centimeters in height, has narrowly elliptical leaves, and sepals up to six millimeters long. Much smaller forms less than five or 10 centimeters tall, often with broader leaves, and sepals three millimeters long are most often encountered. Except for size, there are no significant differences. Giant clones are not rare in the pleurothallidinae. The plant described as *T. greenwoodiana* appears to be the usual form seen in Central America. The form described as *T. nageliana* (Fig. 14.) appears to be a small, vegetative form as seen in Costa Rican *T. brevis* and with glabrous, but ciliated, sepals as seen in some collections from the Andes. Other Mexican collections are often vegetatively larger than those of the latter two collections.

The leaves vary from narrowly to broadly elliptical, often convex, and the short, congested, simultaneously few-flowered raceme is borne behind the leaf. Throughout the distribution the flowers are easily recognized by the ciliate sepals usually being microscopically pubescent to cellular externally. The dorsal sepal is typically a little shorter than the lateral sepals, but not always. Together the lateral sepals form a concave, nearly saccate synsepal.

The petals are small and translucent with minutely ciliate or lacerate margins toward the apex. The lip is oblong and variously ciliate with a minute pair of membranous lobules at the base. Above the base an erect, pyramidal-like callus extends in decreasing height to near the middle where it divides into a pair of low, subparallel calli. The illustration of the lip published in volume 2, page 271, of *Venezuelan Orchids Illustrated* was corrected in the Field Guide, page 746, where it is incorrectly identified as *P. ciliaris*. The column is ciliate-lacerate at the apex.

Trichosalpinx navarrensis (Ames) D.Retana & J.García, Brenesia 37: 125, 1992.
Bas.: *Pleurothallis navarrensis* Ames, Sched. Orchid. 9: 34, 1925. Fig. 15.
Ety.: Named for the community of Navarro where the species was collected.

Plant small, epiphytic, shortly repent, rhizome 2-5 mm long between ramicauls; roots coarse. Ramicauls stout, more or less decumbent, 3-5 mm long, enclosed by 2 lepanthiform sheaths with broadly dilated, oblique, ciliate ostia. **Leaf** apparently suberect, coriaceous, purple-bronze, suffused with purple beneath, elliptical, acute, subacute to obtuse, 10-12 mm long, 5.5-6.5 mm wide, cuneate below into the subpetiolate base. **Inflorescence** a single flower produced successively, peduncle ca. 4 mm long, from near the apex of the ramicaul; floral bracts ca. 2 mm long; pedicels ca. 2 mm long; **sepals** dark red-purple, pubescent, ciliate, fleshy, the dorsal sepal ovate, subacute, 3.25 mm long, 1.75 mm wide, 3-veined, the lateral sepals free to near the base, ovate, subacute, 3.25 mm long, 1 mm wide, 3-veined, forming a mentum with the column-foot; **petals** translucent, narrowly elliptical, acute, ciliate, 2.25 mm long, 0.5 mm wide, 1-veined; **lip** pubescent, ciliate, elliptical, subacute, 2.5 mm long, 0.5 mm wide, the disc with low, conical callus at the base continuous with a central, longitudinal callus, disappearing near the middle, the base with a pair of minute lobules, delicately hinged between to the column-foot; **column** stout, 2 mm long, broadly winged above the middle, with the apical margin fimbriate, the anther and the stigma ventral, the foot thick, 1 mm long.

COSTA RICA: Prov. of Cartago: El Muñeco, south of Navarro, alt. ca. 1400 m, 8 Feb. 1924, *P. C. Standley 33888* (Holotype: AMES; Isotype: US); same collection data, *P. C. Standley 33865* (AMES).

This rare species is known from only two collections made at the same place on the same day by Standley in 1924. The area around Navarro today has been deforested, only patches of few trees remaining in ravines. The holotype is very scanty and no flower remains either on the herbarium sheet or in the glycerine slide collection. Only one old flower at the summit of a swollen ovary is present on the isotype at US. The present description and illustration were made from Ames' publication.

Trichosalpinx navarrensis is characterized by the small, creeping habit. The elliptical leaves are thick and described by Standley as "purple-bronze, especially beneath." The small "dark red-purple" flowers are borne singly on short peduncles. The sepals are ciliate and sparsely pubescent within. The petals are minutely ciliate. The lip is elliptical and densely glandular-pubescent and the base is bilobulate. From a conical callus at the base a longitudinal extension disappears near the middle.

Trichosalpinx orbicularis (Lindl.) Luer, Phytologia 54: 396, 1983. Fig. 16.

Bas.: *Specklinia orbicularis* Lindl., Edwards' Bot. Reg. 24: misc. 31, 1838.
Ety.: From the Latin *orbicularis*, "orbicular," referring to the suborbicular leaves.

Syn.: *Pleurothallis orbicularis* (Lindl.) Lindl., Edwards' Bot. Reg, 28: misc. 79, 1842.

Syn.: *Pleurothallis biflora* H.Focke, Tijdschr. Wis-Natuurk. Wetensch. 2: 197, 1849.
Ety.: From the Latin *biflorus*, "with two flowers," referring to the few-flowered inflorescence.

Syn.: *Lepanthes orbiculata* Lindl. ex Rchb.f., Xenia Orchid. 1: 152, 1856.

Syn.: *Humboldtia biflora* (H.Focke) Kuntze, Rev. Gen. Pl. 2: 667, 1891.

Syn.: *Humboldtia orbicularis* (H.Focke) Kuntze, Rev. Gen. Pl. 2: 668, 1891.

Syn.: *Pleurothallis trachytheca* Lehm. & Kränzl., Bot. Jahrb. Syst. 26: 444, 1899.
Ety.: From the Greek *trachytheca*, "a shaggy cover," referring to the lepanthiform sheaths.

Syn.: *Pleurothallis lancifera* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 27: 48, 1924.
Ety.: From the Latin *lancifer*, "lance-bearing," referring to the lanceolate sepals.

Syn.: *Trichosalpinx oxychilos* Carnevali & G.A.Romero,
Ety.: From the Greek *oxychilos*, "pointed lip," referring to the labellum.

Plant small to medium in size, epiphytic, caespitose; roots slender. Ramicauls comparatively stout, erect, 2-8 cm long, enclosed by 2-5 coarsely ciliate, lepanthiform sheaths. **Leaf** erect, coriaceous, more or less suffused with purple beneath, ovate to broadly elliptical-ovate, subacute to obtuse, 1.5-3.5 cm long, 1-2 cm wide, abruptly contracted below into a petiole ca. 1 mm long. **Inflorescence** a congested, more or less secund, simultaneously few-flowered raceme, ca. 1 cm long, including the filiform peduncle ca. 0.5 cm long, borne behind the leaf, from near the apex of the ramicaul; floral bracts 1-1.5 mm long; pedicels 0.5-1 mm long; ovary 0.5-1 mm long; **sepals** yellow, suffused with purple below the middle, fleshy, especially toward the apices, more or less recurved, glabrous, the dorsal sepal narrowly ovate, acute, sometimes acuminate, 3.5-7.5 mm long, 1-2 mm wide, 3-veined, the lateral sepals connate to near the middle into an ovate, concave, bifid lamina, 3.5-8 mm long, 1.5-3 mm wide, 4-veined (rarely 6-veined) together, forming a shallow mentum with the column-foot, the apices obtuse, sometimes acuminate into terete tails; **petals** translucent, oblong to ovate or obovate, 1.5-2.5 mm long, 0.5-1 mm wide, 1-veined, the apex acute to obtuse, denticulate to fimbriate; **lip** dark purple, ciliate below the middle to microscopically fimbriate above, narrowly triangular, acute, 2.5-4 mm long, 0.75-1 mm wide, the disc with a low, central longitudinal callus from the base to near the middle, the base with a pair of minute lobules, delicately hinged between to the column-foot; **column** white, suffused with purple, stout, 2 mm long, longitudinally winged, with the apex irregularly dentate, the anther and the stigma ventral, the foot thick, 1 mm long.

GUYANA: Demerara, imported by Messrs. Loddiges, March 1830, *Loddiges s.n.* (Holotype: K); Arawan, 1898, *E. F. im Thurn 91* (AMES, K); Inalope falls, Cuyuni River, Oct. 1904, *A. W. Bartlett 8398* (AMES, K); Essequibo River, Morabelli Creek, near sea level, 30 Aug. 1929, *N. Y. Sandwith 157* (AMES, K); same area, 11 Oct. 1945, *Forest Dept. B.G. 5324* (K); Takutu Creek to Puruni River, 3 Dec. 1944, *Forest Dept. B.G. 2135* (K).
FRENCH GUYANA: Forest near Mariepaston, May 1846, *Kegel 1352* (W); Atachi Basea-Berge, alt. 380-500 m, 10 Dec. 1959, *Leuenberger & Hagemann s.n.* (HBG); epiphytic in tall forest, Montagne de Kaw, alt. 300 m, 12 May 1986, *C. Luer & J. Luer 12226* (K, MO); forest near Cacao south of Cayenne, alt. 100 m, 14 May 1986, *C. Luer & J. Luer 12249* (MO).
SURINAME: Paramaribo, 3 Jan. 1845, *H. C. Focke 67* (W); near Berlijn, *H. C. Focke s.n.* (holotype of *P. biflora*: W).
BRAZIL: Edo. Amazonas: Manaus, Balbina, alt. 100 m, collected and cultivated by V. Paiva Castro in São Paulo, 24 Nov. 1989, *C. Luer 14471* (MO).
TRINIDAD: 1845, *D. Bradford 5287* (K); Mora Forest, 26 June 1925, *W. E. Broadway s.n.* (AMES); Blanchisause Road, 30 Jan. 1925, *W. E. Broadway s.n.* (K); St. Ann's, 7 Oct. 12, *W. E. Broadway 4116* (K); without locality, 1877-1880, *A. Fendler 789* (K).
VENEZUELA: Edo. Bolívar: Alto Río Cuyuni, Cerro Escalera, alt. 350 m, 17 Aug. 1962, *J. A. Steyermark, B. & C. Maguire 46768* (AMES); Cerro Uroi, Río Chicanán, 12 Sept. 1962, *J. A. Steyermark, B. & C. Maguire 53755* (AMES); Guatopo, June, 1957, alt. 2000 ft., *G. C. K. Dunsterville 125*; Savannah NE of Pauji, alt. 830-900 m, 5 Nov. 1985, *R. L. Liesner 19500* (MO, VEN).
Terr. Fed. Amazonas: IVIC study site, alt. 120 m, 3 Dec. 1977, *R. Liesner 4144* (MO, VEN); same area, 17 May 1979, *R. L. Liesner 7507* (MO, VEN); Río Negro, Cerro de La Neblina, alt. 780 m, 15-18 Mar. 1984, *R. Liesner 16681* (MO); Atures, east of Río Coro-Coro, near Yutaje, alt. 600 m, 25 Feb. 1987, *R. Liesner & B. Holst 21391* (MO, VEN).

COLOMBIA: Dept. of Antioquia: Río Caldera, collected by E. Valencia, flowered at Colomborquídeas, 16 May 1993, *C. Luer 16908* (MO); Alejandra, La Plata, collected by M. Zapata, flowered at Colomborquídeas, 19 May 1993, *C. Luer 16909* (MO). Dept. of Chocó: Corcovado region, ridge along Yeracüi Valley, alt. 200-275 m, 14 Apr. 1939, *E. P. Killip 35269* (AMES); Upper Río Truando, La Teresita, alt. ca. 100 m, 18 Jan. 1974, *A. Gentry 9335* (MO); Carmen de Atrato, collected by E. Valencia, flowered at Colomborquídeas, 19 May 1993, *C. Luer 16910* (MO); Bahia Solano, without positive collection data, flowered in cultivation at Colomborquídeas, 11 May 1985, *C. Luer 11334* (MO). Dept. of Putumayo: near Mocoa, alt. 530 m, June 1921, *W. Hopp 67* (holotype of *P. lancifera* presumably destroyed at B); Latagua, collected by J. Aguirre, flowered at Colomborquídeas, 19 May 1993, *C. Luer 16904* (MO). Dept of Risaralda: Pueblo Rico, collected by E. Valencia, flowered at Colomborquídeas, 19 May 1993, *C. Luer 16905* (MO). Dept. of Valle de Cauca: humid forest near Juntas del Dagua, alt. 300-500 m, 4 May 1886, *F. C. Lehmann 8224* (holotype of *P. trachytheca* presumably destroyed at B; lectotype here designated: K; isolectotypes: AMES, NY). Dept. of Vaupes: Río Kuduyarí, Yapobodá, 4 Oct. 1951, *R. E. Schultes & I. Cabrera 14315* (AMES, MO).

PANAMA: Prov. of Chiriquí: epiphytic in forest near San Vicente, alt ca. 300 m, Nov. 1976, *C. Luer & H. Butcher 1246* (SEL); between Gualaca and Fortuna dam site, alt. 1260 m, 10 Apr. 1980, *T. B. Croat 50052* (MO). Prov. of Coclé: vicinity of El Valle de Antón, alt. 600-1000 m, *P. Allen 1242, 1676, 2206, 2259* (AMES); same area, alt. 900 m, 17 May 1985, *C. Luer, J. Luer, R. Dressler & K. Dressler 11394* (MO). Prov. of Herrera: above Chepo de las Minas, alt. 700 m, 19 Dec. 1977, *J. P. Folsom, R. B. Channell & G. Small 6973* (MO).Prov. of Panamá: Llano-Cartí road, alt. 600 m, 3 Mar. 1976, *C. Luer, J. Luer, R. Dressler & P. Taylor 717* (SEL); Cerro Jefe, alt. ca. 1000 m, Mar. 1976, *C. Luer, J. Luer, R. Dressler & P. Taylor 739* (SEL); flowered in cultivation 30 Dec. 1980, *C. Luer 5604* (SEL).

COSTA RICA: Prov. of Limón: Talamanca, Bratsi. Amburi, Alto Lari, Río Lari, alt. 300 m, 25 Feb. 1992, *G. Herrera 5058* (CR, MO). Prov. of San José: Parqué Nacional Braulio Carillo, along Sendero La Botella, alt. 750 m, 5 Jan 1991, *S. Ingram & K. Farrell 838* (CR, MO, SEL). Without locality, *A. Endres 44B* (W).

ECUADOR: Prov. of Esmeraldas: on *Crescentia* in the planes, near La Concepcion, 11 Sept. 1879, *F. C. Lehmann 223* (W); wet forest west of Lita, alt. 750 m, 18 Jan. 1987, *C. Luer, J. Luer, C. Dodson & A. Hirtz 12372, 12391* (MO); Fila de Bilsa, SE of El Salto between Atacames and Muisne, alt. 280 m, 30 Jan. 1991, *A. Gentry, R. Foster & C. Josse 72988, 72767* (MO). Prov. of Imbabura: Los Cedros Reserve, alt. 1400 m, 23 Jan. 1993, *S. Dalström, T. Höijer & H. Wanntorp 1736* (MO). Prov. of Napo: forest along Río Cascales east of Lumbaquí, alt. 450 m, 9 Feb. 1986, *C. Luer, J. Luer, A. Hirtz, W. Flores & A. Embree 11769* (MO). Prov. of Pichincha: between Maldonado and Mindo, alt. 900 m, Aug. 1989, *A. Hirtz 4484* (MO). Prov. of Sucumbios: Imuya Cocha along Río Largartococha, alt. 200 m, 20 Oct. 1991, *C. H. Dodson, P. M. Dodson & G. Romero 18915* (MO).

PERU: Dept. of Loreto: along Río Aguaytia, 3 Oct. 1972, *T. B. Croat 21013* (MO).

Trichosalpinx orbicularis treated as a species-complex is frequent and widely distributed across northern South America at low altitudes into Central America. The leaves are ovate to broadly elliptical and borne by rather stout ramicauls with coarsely ciliate sheaths. Two to six flowers are produced simultaneously in a short, compact, secund raceme low on the backside of the leaf. Sometimes the flowers appear more or less in a transverse row. The narrowly ovate sepals are glabrous; the petals are minutely fimbriate with the apex sometimes setiform; and the lip is narrowly triangular and acute with the margins ciliate to minutely fringed.

Some Central American forms are intermediate between *T. orbicularis* and *T. blaisdellii*. Occasionally larger flowers with acuminate sepals with the apices of the laterals elongated and thickened occur in Panama and adjacent Colombia. *Trichosalpinx caudata* is little more than a local variation. Vegetatively, *T. rotundata* is little more than a large, local variation with orbicular, convex leaves. Most of the plants from the eastern part of the distribution across northern South America have elliptical leaves and smaller flowers.

A crude illustration of this species at K was included in a collage in the frame of an illustration of *Lepanthes jamesonii*, which was presumably designed for an intended publication. It was simply identified as "orbiculata." From this picture alone, Reichenbach described both *L. jamesonii* and *L. orbiculata* in his *Xenia Orchidaceae*.

Trichosalpinx patula Luer, sp. nov. Fig. 17.

Ety.: From the Latin *patulus*, "open, gaping," in reference to the flowers.

Species haec **T. dependens** affinis, sed sepalis lateralibus decurvis non synsepalum concavum formantibus distinguitur.

Plant small to medium in size, epiphytic, caespitose, more or less pendent to suberect; roots slender. Ramicauls ascending to pendent, slender, more or less flexuous, 5-15 cm long, enclosed by 5-12 lepanthiform sheaths with long, oblique, dilated, ciliate ostia. **Leaf** suberect or pendent, coriaceous, elliptical to narrowly elliptical, acute, 4-10 cm long, 1-2 cm wide, cuneate below into a petiole 1-3 mm long. **Inflorescence** a congested, distichous, simultaneously few- to several-flowered raceme, 2-4 cm long, including the filiform peduncle 1-2 cm long, from near the apex of the ramicaul; floral bracts 2-2.5 mm long; pedicels 2-2.5 mm long; ovary 1.5-2 mm long; **sepals** tan, yellow suffused with purple, or purple, sparsely ciliate, fleshy, especially toward the apices, the dorsal sepal ovate, narrowly obtuse, 4-7 mm long, 2-3 mm wide, 3-veined, the lateral sepals connate to about the middle into an ovate, bifid, recurving lamina with subacute apices, 3.5-5.5 mm long, 2.5-4 mm wide expanded, 4-veined, forming a mentum with the column-foot; **petals** translucent, ciliate-denticulate, elliptical-oblong to triangular, acute or obtuse, 2-3 mm long, 0.75-1.25 mm wide, 1-veined; **lip** dark brown or purple, ciliate to long-ciliate, oblong, 2-3 mm long, 1 mm wide, with the apex rounded, the sides thin, slightly incurved below the middle, the disc with a low, obtuse callus above the base, the base with a pair of comparatively large, diverging lobules, delicately hinged between to the column-foot; **column** stout, 1.5-2.5 mm long, with broad, angled wings above the middle, bidentate at the apex, the anther and the stigma ventral, the foot thick, 0.5 mm long.

ECUADOR: Prov. of Zamora-Chinchipe: east of the pass east of Loja, alt. 2250 m, 22 May 1988, *C. Luer, A. Hirtz, W. Flores, A. Andreetta & W. Teague 13595* (MO); same area, alt. 2300 m, 21 Jan. 1922, *C. Luer, J. Luer, P. Jesup, A. Jesup & A. Hirtz 16088, 16162* (MO). Prov. of Morona-Santiago: north of Gualaquiza, July 1975, *C. Luer, G. Luer & S. Wilhelm 611* (SEL). Prov. of Loja: above Vilcabamba, alt. 1650 m, 10 May 1981, *C. Luer, J. Luer & D. D'Alessandro 6136* (SEL);
VENEZUELA: Edo. Bolívar: base of Cerro Paraucaipa, near Auyantepui, alt. ca. 400 m, Aug. 1970, *G.C.K. Dunsterville 1150.*
BOLIVIA: Dept. of Santa Cruz: moist forest south of Yapacaní, alt. 650 m, 7 Sept. 1991, *C. Luer, J. Luer, L. Moreno & D. Ric 15400* (MO).

This species is a closely allied member of the frequent *T. dependens*-complex, and it occurs wholly within the distribution of the latter. Although vegetatively very similar, most plants of *T. patula* are a little larger with stouter ramicauls and narrower leaves. The average size of the gaping flowers is a little larger. The lateral sepals are similarly connate below the middle, but they are recurved above the middle without forming a concave synsepal, the only distinctive difference. Morphologically similar, the average size of the sepals, petals and lips of *T. patula* is a little larger. Intermediate specimens are frequent. No doubt some collections attributed above to *T. dependens* could be attributed to *T. patula*.Superficially, *T. patula* appears most similar to the Central American *T. blaisdellii*. The most distinct difference lies in the pair of basal labellar lobules. Those of *T. patula* as well as those of *T. dependens* are relatively large and obliquely spreading from the basal angles. Those of *T. blaisdellii* are small, membranous, and directed posteriorly. The column of *T. patula* is winged above the middle and the apex is simply bidentate, not minutely denticulate or fringed as in *T. blaisdellii*. *Trichosalpinx patula* was identified as the *T. blaisdellii* in *Venezuelan Orchids Illustrated.*

Trichosalpinx pringlei (Schltr.) Luer, Phytologia 54: 396, 1983. Fig. 18.

Bas.: *Pleurothallis pringlei* Schltr., Repert. Spec. Nov. Regni Veg. 3: 20, 1906.
Ety.: Named in honor of Cyrus G. Pringle of St. Louis, MO, who discovered this species.

Plant small, epiphytic, repent; rhizome comparatively stout, 5-25 mm long between ramicauls; roots slender. Ramicauls ascending to erect, 10-20 mm long, enclosed by 2-3 ciliate, lepanthiform sheaths.

Leaf erect, coriaceous, elliptical, subacute to obtuse, 15-40 mm long, 7-15 mm wide, cuneate below into a petiole 1 mm long. **Inflorescence** a subdense, successively several-flowered raceme, often with 3-5 flowers open simultaneously, up to 9 cm long, including the filiform peduncle ca. 1.5 cm long, borne beyond the leaf, from near the apex of the ramicaul; floral bracts 1.5 mm long; pedicels 1 mm long; ovary 1 mm long; **sepals** translucent greenish, suffused with red-brown, glabrous, the dorsal sepal ovate, acute to subacute, 4-5 mm long, 2 mm wide, 3-veined, the lateral sepals connate to near the middle into an ovate, bifid lamina with acute apices, 4-5 mm long, 2.75 mm wide, 4-veined together, forming a shallow mentum with the column-foot; **petals** translucent, oblong to ovate, 1.75 mm long, 0.4 mm wide, 1-veined, the apex acute, serrulate; **lip** dark purple, oblong-trilobed, 3 mm long, 1.25 mm wide, the anterior lobe ovate, obtuse, with microscopically irregular margins, the lateral lobes below the middle, erect, obtuse, oblique, with the anterior margins denticulate, the disc with a low, central longitudinal callus from the base to near the middle, the base with a pair of minute lobules, delicately hinged between to the column-foot; **column** white, stout, 2 mm long, broadly winged above the middle, with the apex irregularly dentate, the anther and the stigma ventral, the foot thick, 1 mm long.

MEXICO: Edo. Oaxaca: Sierra de San Filipe, epiphytic on oaks, alt. 2400-3000 m, 14 June 1894, *G. C. Pringle 4709* (Lectotype: MEXU; Isolectotypes: AMES, BM, HB, HBG, K, NY, US, W); Mt. San Felipe, "Ojo de Agua", alt. 2400 m, 27 Mar. 1934, *O. Nagel 3745* (AMES). Edo. Chiapas: Agua Catenango, flowered in cultivation at U.C. Berkeley Botanical Garden, 4 Dec. 1959, *R. Alva s.n.* (AMES); SE of Teopisca toward Comitán, alt. 2040 m, 11 Aug. 1975, *G. Davidse & J. Davidse 9511* (MO). Edo. Guerrero: near Omiltemi, alt. 6350 ft., 27 Oct. 1944, *J. A. Sharp 4415705* (AMES). Without collection data, flowered in cultivation by W. Teague in San Francisco, CA, Aug. 1979, *C. Luer 4104* (SEL). GUATEMALA: Dept. of Quetzaltenango: Río Samala below Zunil, alt. 2500 m, 24 Jan. 1940, *J. A. Steyermark 34969* (AMES). Sierra de las Minas, Finca San Vicente, alt. 2300 m, 1-4 Aug. 1971, *F. Hamer A-145* (MO).

This little species is apparently confined to southern Mexico and adjacent Guatemala. It is unique in the genus with the repent habit and an inflorescence that exceeds the leaf in length. The sepals are glabrous, the minute petals are serrulate, and the lip is three-lobed with the lobes below the middle, erect, obtuse and oblique. A minute pair of basal lobules flank the thin hinge to the column-foot.

Trichosalpinx psilantha (Luer & Vásquez) Luer, sp. nov. Fig. 19.

Ety.: From the Greek *psilantha*, "a hairless flower," referring to the glabrous flowers.

Species haec *T. inquisiviënsis* (Luer & Vásquez) Luer similis, sed sepalis glabris, petalis spathulatis denticulatis et labello glabro tenuissimo anguste obtuso distinguitur.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls slender, erect to suberect, 6-10 cm long, enclosed by 5-9 lepanthiform sheaths with broadly dilated, oblique, ciliate ostia. **Leaf** erect, coriaceous, suffused in purple beneath, broadly elliptical, obtuse, 3-5 cm long, 2.2-3.2 cm wide, contracted below into a petiole 5-6 mm long. **Inflorescence** a congested, successively 1- to 3-flowered raceme, up to 1 cm long, including the peduncle 5 mm long, produced successively in a fascicle at the base of the backside of the leaf, from near the apex of the ramicaul; floral bracts 1-1.5 mm long; pedicels 3 mm long; ovary 1.5 mm long; **sepals** glabrous, yellowish white, suffused with red-purple except basally, the dorsal sepal elliptical, obtuse, 3.5 mm long, 1.75 mm wide, 3-veined, with a rare, microscopic hair, the lateral sepals connate to above the middle into a broadly ovate, deeply concave, bifid lamina with rounded, concave apices, 4 mm long, 2.5 mm wide unexpanded, 4-veined together, forming a shallow mentum with the column-foot; **petals** translucent, oblong-spathulate, the apex rounded and denticulate, 1.5 mm long, 0.6 mm wide, 1-veined; **lip** yellow-white, lightly suffused with purple margins, thin, elliptical with the apex narrowly obtuse, 2.5 mm long, 0.8 mm wide, the disc slightly thickened centrally, the base with a pair of lobules, delicately hinged between to the column-foot; **column** white, stout, 1.75 mm long, the apex bidentate, the anther and stigma ventral, the foot thick, 1 mm long.

BOLIVIA: Dept. of La Paz: Inquisivi, epiphytic in cloud forest between Inquisivi and Cirquata, alt. 2500 m, 27 Jan. 1981, *C. Luer, J. Luer & R. Vásquez 5805B* (Holotype: SEL).

This species is apparently endemic in northern Bolivia where it was discovered near the locality where *T. inquisiviënsis* was discovered. It is similar in appearance to the latter, but the sepals are glabrous and deeply concave; the petals are spathulate and minutely denticulate; and the lip, also glabrous, is very thin with a narrowly obtuse apex.

Trichosalpinx ringens Luer, Lindleyana 11: 108, 1996. Fig. 20.

Ety.: From the Latin *ringens*, "gaping," referring to the bilabiate flower.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 5-9 cm long, enclosed by 8-10 coarsely long-ciliate, lepanthiform sheaths. **Leaf** erect, coriaceous, ovate, acute to subacute, 28-35 mm long, 15-20 mm wide, contracted below into a petiole 1 mm long. **Inflorescence** a fascicle of successive, single-flowered peduncles 5-7 mm long, borne in front of the base of the leaf, from near the apex of the ramicaul; floral bract 2.5 mm long; pedicel 2.5 mm long; ovary 2 mm long; **sepals** purple-brown, fleshy, subcarinate, glabrous, the dorsal sepal narrowly obovate, acute, 9 mm long, 3 mm wide, 3-veined, the lateral sepals connate into a concave, transversely obovate synsepal with the apex transversely obtuse, shallowly bifid, 5 mm long, 6 mm wide, 4-veined together; **petals** translucent, oblong, 3 mm long, 1.6 mm wide, 3-veined, the apex obtuse, ciliate; **lip** marked with dark purple-brown, thick, oblong-subtrilobed, strongly arcuate, 2.5 mm long, 1.35 mm wide, the apex broadly rounded, the lateral lobes rounded, erect, pubescent and long ciliate, occupying the middle third, the disc deeply cleft between a pair of erect, lamellate plates, and with a longitudinal lamella on the lower third above the base, hinged between to the column-foot; **column** white, stout, 2 mm long, with the apex finely denticulate-erose, the anther and the stigma ventral, the foot thick, 1 mm long.

PANAMA: Prov. of Chiriquí: epiphytic in cloud forest, Cerro Colorado, alt. 1670 m, 15 Feb. 1985, *C. Luer, J. Luer, R. Dressler & K. Dressler 10539* (MO); Cerro Colorado, 50 km north of San Félix, alt. 1400-1450 m, 20 Sept. 1977, *R. L. Dressler 5715* (MO).
COSTA RICA: Prov. of Cartago: above San Cristóbal Norte, alt. 1780 m, 26 Mar. 1995, *C. Luer, J. Luer, J. Atwood, R. Dressler, K. Dressler & Dora Mora de Retana 17480* (MO).

This unusual species occurs infrequently in western Panamá and Costa Rica. It is distinguished from all the other species by the coarsely long-ciliate, lepanthiform sheaths, and flowers produced singly in a fascicle. The thick, narrow dorsal sepal stands erect above the much shorter, transversely obovate synsepal. The ciliate petals are three-veined (one-veined in all others). The lip also deviates from the usual pattern by being deeply cleft between a pair of plates between erect, rounded, ciliate and pubescent medial lobes. A longitudinal carina passes from the cleft to the base which lacks the pair of lobules found in all the other species.

Trichosalpinx rotundata (C.Schweinf.) Dressler, Novon 7: 124, 1997. Fig. 21.

Bas.: *Pleurothallis rotundata* C.Schweinf., Bot. Mus. Leafl. 4: 115, 1937.
Ety.: From the Latin *rotundatus*, "rounded," referring to the suborbicular leaves.

Syn.: *Pleurothallis operculata* Luer, Phytologia 49: 213, 1981.
Ety.: From the Latin *operculatus*, "with a lid," referring to the round leaf over the inflorescence.

Syn.: *Trichosalpinx operculata* (Luer) Luer, Phytologia 54: 396, 1983.

Plant small to medium in size, epiphytic, caespitose; roots slender. Ramicauls comparatively stout, erect, 3-11 cm long, enclosed by 5-10 ciliate, lepanthiform sheaths. **Leaf** suberect to spreading or horizontal, coriaceous, dark green above, purple beneath, convex, broadly elliptical to suborbicular, with the apex obtuse to rounded, 2.5-4 cm long, 1.5-3.5 cm wide, abruptly contracted below into a petiole 1 mm long. **Inflorescence** a congested, simultaneously 2- to 3-flowered raceme, ca. 10 mm long, including the filiform peduncle 3-5 mm long, borne beneath the leaf, from near the apex of the ramicaul; floral bracts 1.5-2 mm long; pedicels 1.5 mm long; ovary 1 mm long; **sepals** yellow, suffused with purple, fleshy, especially toward the apices, ciliate, the dorsal sepal narrowly ovate, acute, 5-7 mm long, 1.5 mm wide, 3-veined, the lateral sepals connate to near the middle into an ovate, bifid lamina, 5-8 mm long, 2-2.5 mm wide, 4-veined together, the apices acuminate, thickened, linear, recurved; **petals** translucent, oblong to ovate, 2.5-3 mm long, 0.5-0.8 mm wide, 1-veined, the apex acute, ciliate-denticulate; **lip** yellow, glabrous to microscopically cellular on the margins, narrowly triangular, acute, 3-3.25 mm long, 0.8-1 mm wide, the disc with a low, central longitudinal callus from the base to near the middle, the base with a pair of minute lobules, delicately hinged between to the column-foot; **column** white, suffused with purple, stout, 2 mm long, longitudinally winged, with the apex irregularly dentate, the anther and the stigma ventral, the foot thick, 1 mm long.

PANAMA: Prov. of Coclé: mountains beyond La Pintada, alt. 400-600 m, 16 Feb. 1935, *A. A. Hunter & P. H. Allen 561* (Holotype: AMES); North rim of El Valle de Antón, alt. 600-1000 m, 12 Feb. 1939, *P. H. Allen 1676* (BM). Prov. of Veraguas: epiphytic in cloud forest, El Copé, collected by R. L. Dressler, flowered in cultivation 18 July 1979, *C. Luer 4075* (holotype of *P. operculata*: SEL).
COSTA RICA: Prov. of Puntarenas: Reserva Monteverde, alt. 1600 m, 4 Dec. 1989, *W. Morris & J. T. Atwood 4023* (CR, SEL).

This species is encountered occasionally in Panama and Costa Rica. It is closely related to the frequent, variable and widely distributed *T. orbicularis*, but *T. rotundata* is distinguished by the usually larger habit with larger, round, convex, horizontal leaves and larger flowers borne beneath. The sepals are slender and ciliate (glabrous in *T. orbicularis*) and the apices of the lateral sepals are thickened and tail-like, and more or less recurved, as sometimes seen in *T. orbicularis*. The narrowly acute lip is minutely ciliate-denticulate in *T. orbicularis*.

Schweinfurth admitted that he described *P. rotundata* from an old flower "at the summit of a swollen ovary in an advanced stage of anthesis." Because he described the lip as being fimbriate on the lower third, a smooth-lipped taxon from Coclé was described as *P. operculata*. A rehydrated flower from the type-specimen of *T. rotundata* at AMES confirms that the two are synonymous.

Trichosalpinx trachystoma (Schltr.) Luer, Phytologia 54: 397, 1983. Fig. 22.

Bas.: *Pleurothallis trachystoma* Schltr. Repert. Spec. Nov. Regni Veg. Beih. 19: 196, 1923.

Ety.: From the Greek *trachystoma*, "a shaggy opening," referring to the lepanthiform sheaths.

Plant small to medium in size, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 2-7 cm long, enclosed by 6-10 lepanthiform sheaths with dilated, ciliate ostia. **Leaf** erect, coriaceous, elliptical, obtuse, 20-33 mm long, 13-18 mm wide, contracted below into a petiole 3-4 mm long. **Inflorescence** a congested, distichous, simultaneously 2- to 4-flowered raceme, 10-12 mm long including the filiform peduncle 4-5 mm long, borne behind the base of the leaf, from near the apex of the ramicaul; floral bracts 1.5 mm long; pedicels 0.75 mm long; ovary 1 mm long; **sepals** red-purple, white toward the base, subcarinate, glabrous externally, microscopically ciliate, fleshy, the dorsal sepal broadly obovate, obtuse, 3.25 mm long, 2.25 mm wide, 3-veined, microscopically pubescent toward the apex, the lateral sepals connate into a deeply concave, obovoid, cymbiform synsepal with the apex rounded, 3.5 mm long, 3 mm wide, 6-veined together, forming a mentum with the column-foot; **petals** translucent white, oblong, 1.5 mm long, 0.6 mm wide, 1-veined, the apex subtruncate, erose; **lip** red-purple, glabrous, subspathulate or pyriform in outline, 2.5 mm long, 1.7 mm wide, flat with the apex dilated, rounded, cellular-glandular, the disc with a low, longitudinal callus, ending in a low, subpyramidal callus above the base, the base with a pair of obscure lobules, delicately hinged between to the column-foot; **column** white, stout, 1.75 mm long, with the apex minutely erose, the anther and the stigma ventral, the foot 1 mm long.

COSTA RICA: Prov. of Alajuela: epiphytic in forest of San Pedro de San Ramón, alt. 950 m, June 1921, *A. M. Brenes 40* (holotype of *P. trachystoma* presumably destroyed at B, lectotype: AMES 31257, illustr. of the holotype).

GUATEMALA: Dept. of Alta Verapaz: "Patulul," Suchtipequez, alt. 350 m, collected by Dr. Cesar Solano, flowered in cultivation by O. Tinschert, 18 Feb. 1981, *C. Luer 5844* (SEL); near Cubilquitz, collected by H. Ibañez, flowered in cultivation in Cobán, 29 Nov. 1990, *C. Luer 14873* (MO).

This species is apparently rare, known from lowlands of Costa Rica and Guatemala. The Guatemalan collections are slightly larger than the original from Costa Rica. It is related to the sympatric and variable *T. blaisdellii*, but it differs in the smaller, subglobose flowers borne in a short raceme near the base of the leaf. The sepals are essentially glabrous, the laterals forming a deeply concave, cymbiform synsepal. The dorsal sepal is broadly obovate. The minute petals are erose at the truncate apex. Most distinct is the flat, spathulate, glabrous lip.

Trichosalpinx triangulipetala (Ames & Correll) Luer, Phytologia 54: 397, 1983.

Bas.: *Pleurothallis triangulipetala* Ames & Correll, Bot. Mus. Leafl. 10: 77, 1942. Fig. 23.

Ety.: From the Latin *triangulipetalus*, "with a triangular petal," referring to the shape of the petals.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls relatively stout, erect, 4-5 cm long, enclosed by 6-8 ciliate, lepanthiform sheaths. **Leaf** erect, rigidly coriaceous, elliptical, subacute to obtuse, 20-35 mm long, 15-20 mm wide, contracted below into a petiole 3-4 mm long. **Inflorescence** a lax, simultaneously 3- to 6-flowered, raceme, 15-25 mm long including the filiform peduncle 5-8 mm

long, borne behind the leaf, from near the apex of the ramicaul; floral bracts 1.5 mm long; pedicels 1.5 mm long; ovary 1-1.5 mm long; **sepals** red-purple, white toward the base, glabrous, sparsely minutely ciliate, the dorsal sepal broadly oblong-triangular, obtuse, 3-5 mm long, 1.75-2.5 mm wide, 3-veined, the lateral sepals oblong-ovate, oblique, thickened toward the apices, connate to near the middle into a reflexed, elliptical synsepal, 3-4.5 mm long expanded, 2-3.5 mm wide together, forming a mentum below the column-foot, the apices close, obtuse; **petals** translucent white, triangular, acute to narrowly obtuse, entire, 1.5-2.25 mm long, 0.75-1 mm wide at the base, 1-veined; **lip** red-purple, finely ciliate, oblong-subpyriform, 2-2.75 mm long, 0.75-1 mm wide, with the apex rounded, convex, the disc with a longitudinal callus, ending in an erect, subacute lamella above the base, divided into 2 calli above the middle, the base with a pair of membranous lobules, hinged between to the column-foot; **column** white, stout, 1.75-2.2 mm long, minutely denticulate-erose, the anther and the stigma ventral, the foot 1 mm long.

GUATEMALA: Dept. of Sacatepéquez: Barranco Hondo, lower slopes of Volcán de Fuego, alt. ca. 1800 m, 16 Dec. 1938; *P. C. Standley 60278* (Holotype: F); without collection data, flowered in cultivation by M. Béhar at Mixco, Dec. 1994, *C. Luer 17344* (MO); same collection data, *C. Luer 17345* (MO).

This species, endemic and local in Guatemala, is related to *T. blaisdellii*, but it is readily distinguished from the latter by the sparsely ciliate sepals with the dorsal sepal obtuse and the laterals connate to near the middle and reflexed. The petals are glabrous, triangular and acute. The oblong lip is finely ciliate, with a convex apex, and with an erect, "sun-dial" callus similar to that of *T. memor* at the base. The callus similarly forks into a pair of low calli above the middle.

Trichosalpinx vasquezii Luer, sp. nov. Fig. 24.

Ety.: Named in honor of Roberto Vásquez Ch. of Santa Cruz, Bolivia, co-discoverer of this species.

Planta mediocris pulchella, foliis obovatis purpureo striatis, vaginiis lepanthiformibus albis, floribus parvis atropurpureis, racemo brevissimo, sepalis glabris obtusis, petalis acutis; labello oblongo ciliato.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 4-6 cm long, enclosed by 7-9 white, lepanthiform sheaths with long, oblique, dilated, ciliate ostia. **Leaf** erect, coriaceous, with 3 prominent, purple stripes, elliptical-obovate, subacute, 3.5-4.5 cm long, 1.2-1.8 cm wide, cuneate below into a petiole 1 mm long. **Inflorescence** a congested, distichous, simultaneously 1- to 4-flowered raceme, 5 mm long including the filiform peduncle 2-3 mm long, from near the apex of the ramicaul; floral bracts 1.5 mm long; pedicels 1.5 mm long; ovary 1 mm long; **sepals** dark purple, white toward the base, glabrous, fleshy, especially toward the apices, the dorsal sepal ovate, obtuse, 3 mm long, 1.5 mm wide, 3-veined, the lateral sepals connate to about the middle into an ovate, obtuse, concave, bifid synsepal, 3 mm long, 2 mm wide, 4-veined together, convex below the middle, forming a mentum with the column-foot at the base; **petals** translucent purple, microscopically cellular erose, elliptical-oblong, acute, 1.6 mm long, 0.6 mm wide, 1-veined; **lip** dark purple, ciliate, oblong, obtuse, 1.75 mm long, 0.8 mm wide, the sides thin, slightly incurved below the middle, the disc with a low, flat, longitudinal callus, the base with a pair of small lobules, delicately hinged between to the column-foot; **column** stout, 1.7 mm long, with broad wings above the middle, bidentate at the apex, the anther and the stigma ventral, the foot thick, 1 mm long.

BOLIVIA: Dept. of Cochabamba: epiphytic in seasonally dry forest at Bulo-bulo, alt. 300 m, west of Yapacaní in the dept. of Santa Cruz, 22 Aug. 1991, *C. Luer, J. Luer, R. Vásquez & D. Ric 15342* (Holotype: MO).

Vegetatively, this species is perhaps the most beautiful and most distinct in the genus. It is known only from one seasonally dry forest in lowland central Bolivia where it is apparently endemic. The conspicuous, snow white, dilated, lepanthiform sheaths of the ramicauls contrast with the obovate leaves with three prominent, purple stripes. The very small, dark purple flowers are produced simultaneously in a crowded raceme at the base of the backside of the leaf. The sepals are glabrous and obtuse; the petals are acute; and the lip is oblong and ciliate with a pair of small, basal lobules. The flowers are similar to those of *Pleurothallis ricii* Luer & Vásquez (subgenus *Specklinia* section *Muscosae*) with which it grows in same forest.

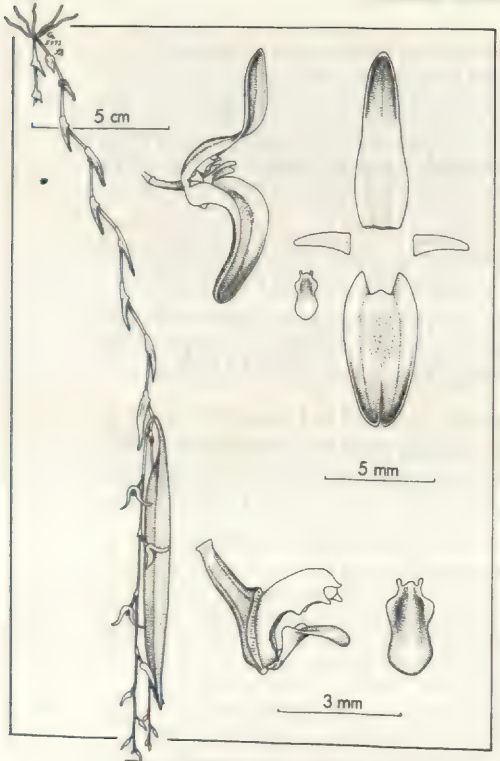

Fig. 1. Trichosalpinx berlineri

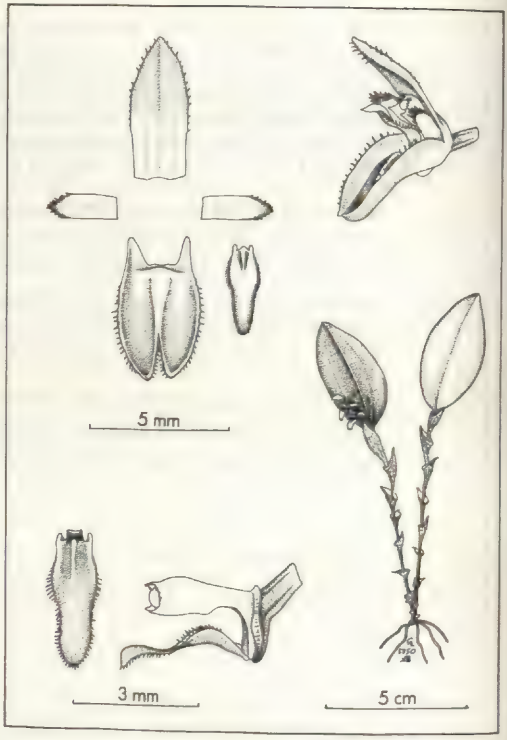

Fig. 2. Trichosalpinx blaisdellii

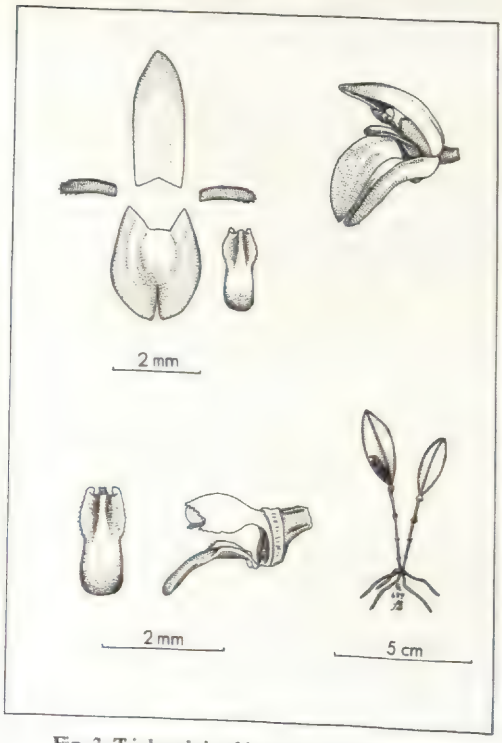

Fig. 3. Trichosalpinx blaisdellii (T. tamayoana)

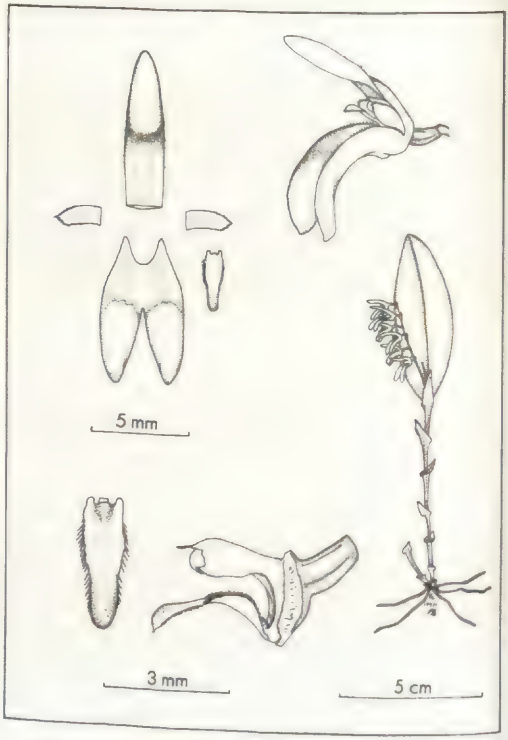

Fig. 4. Trichosalpinx blaisdellii (T. lankesteriana)

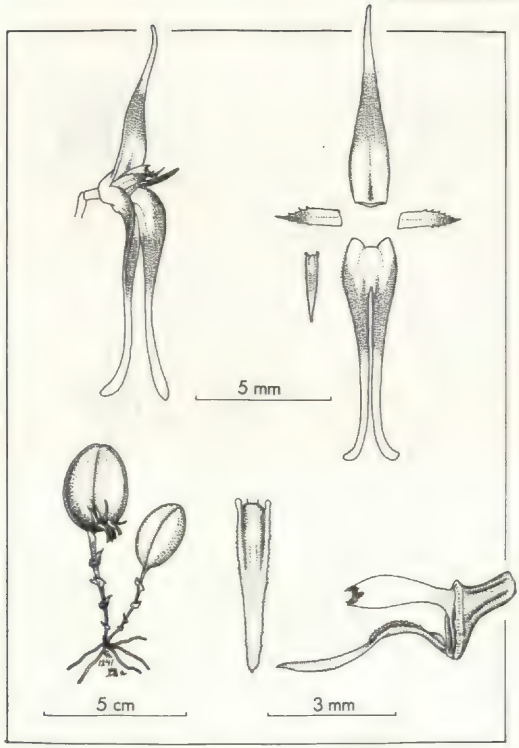

Fig. 5. Trichosalpinx caudata

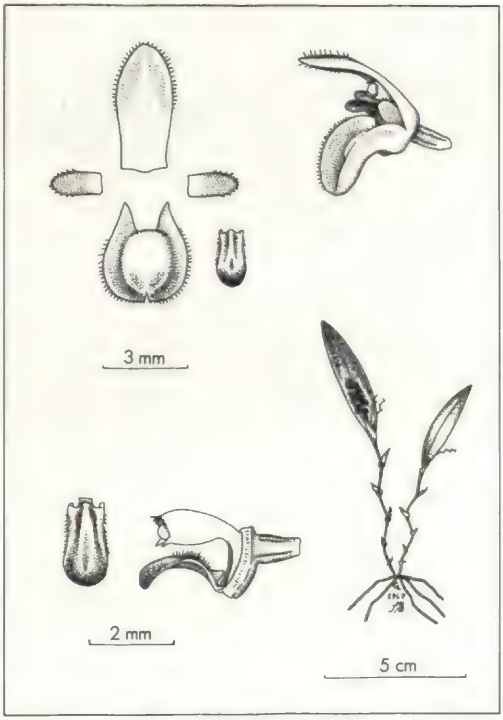

Fig. 6. Trichosalpinx ciliaris

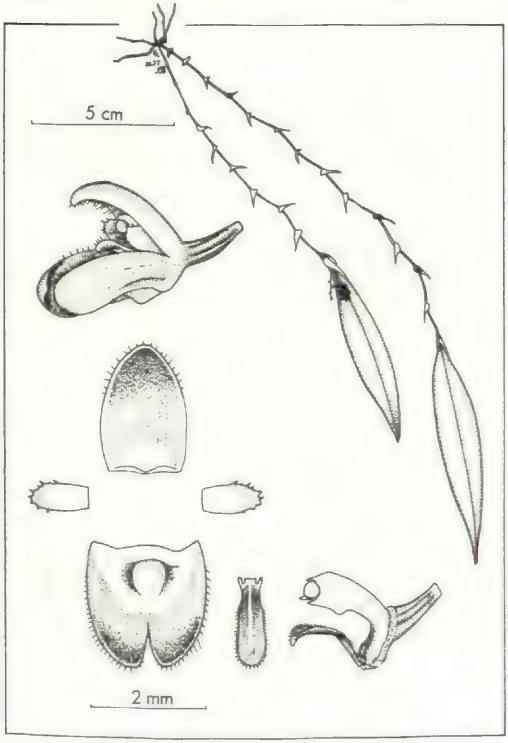

Fig. 7. Trichosalpinx dependens

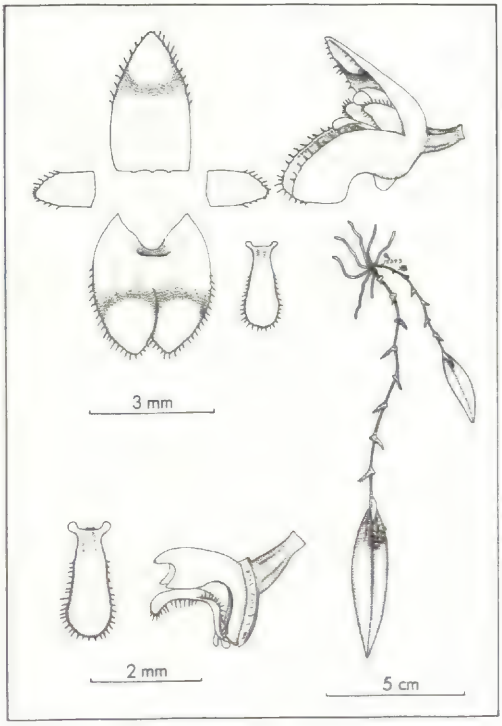

Fig. 8. Trichosalpinx dependens

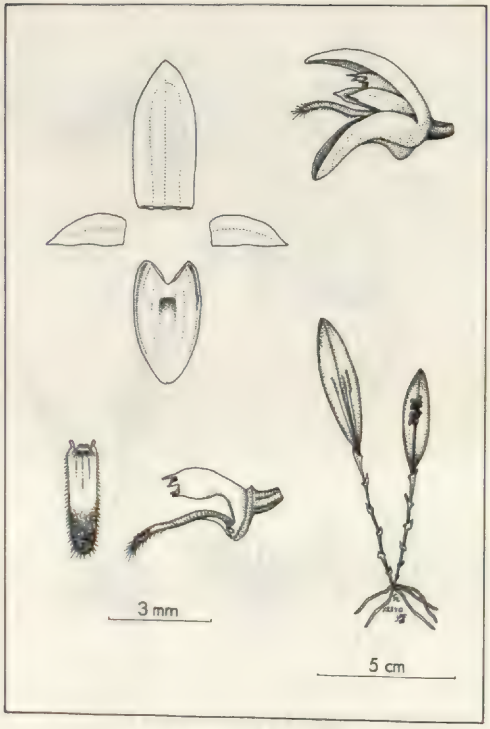

Fig. 9. Trichosalpinx egleri

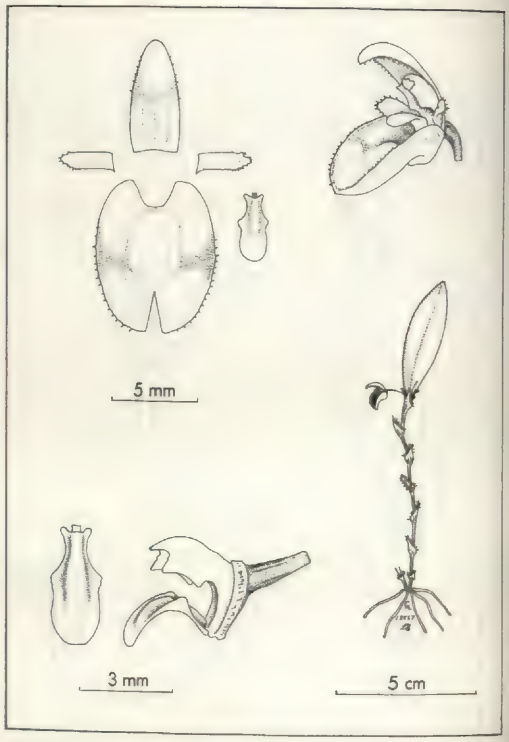

Fig. 10. Trichosalpinx glabra

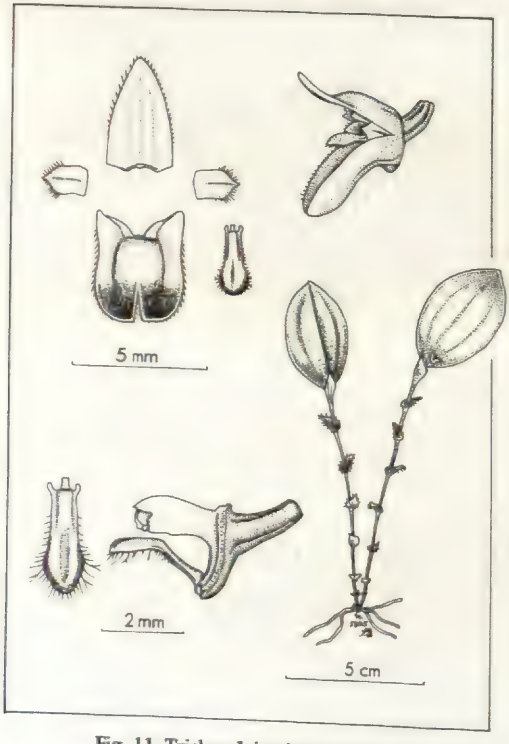

Fig. 11. Trichosalpinx inquisiviënsis

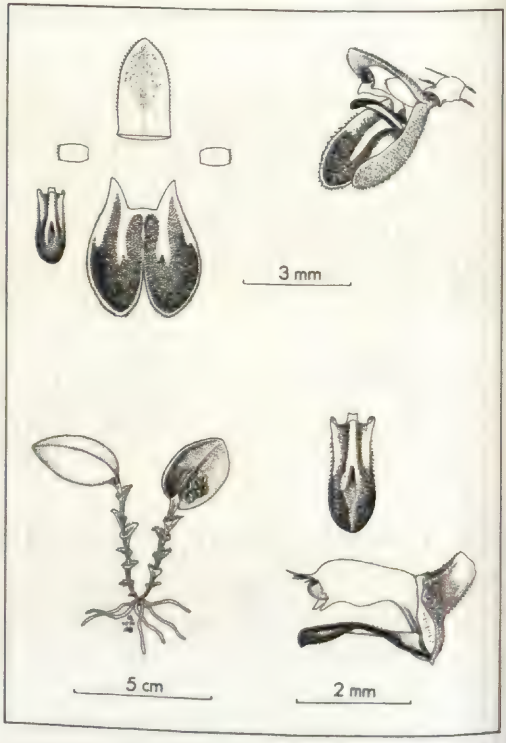

Fig. 12. Trichosalpinx memor

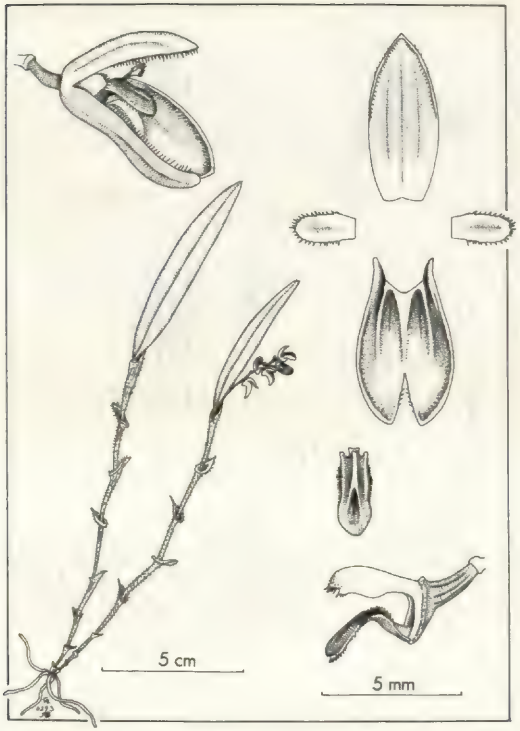

Fig. 13. Trichosalpinx memor (T. minutipetala)

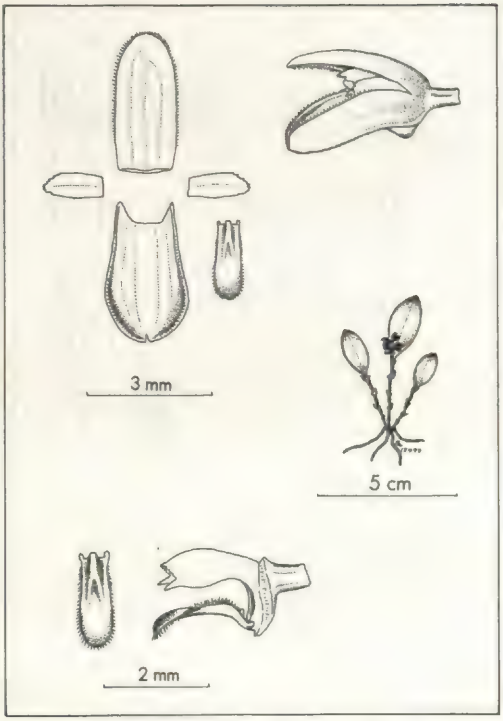

Fig. 14. Trichosalpinx memor (T. nageliana)

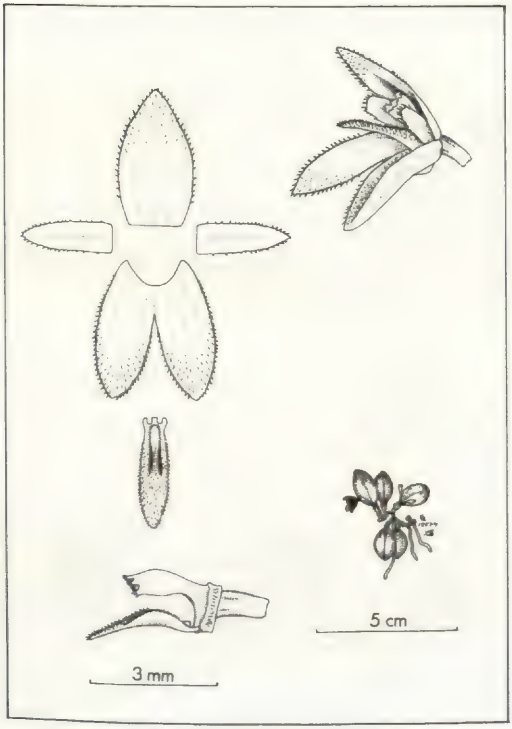

Fig. 15. Trichosalpinx navarrensis

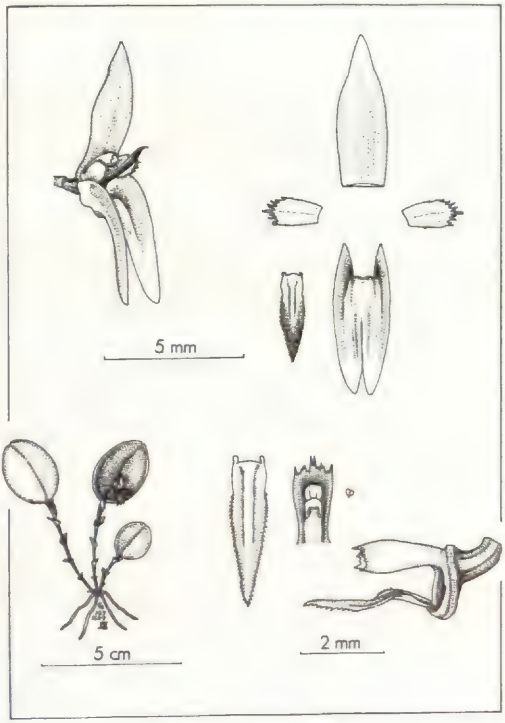

Fig. 16. Trichosalpinx orbicularis

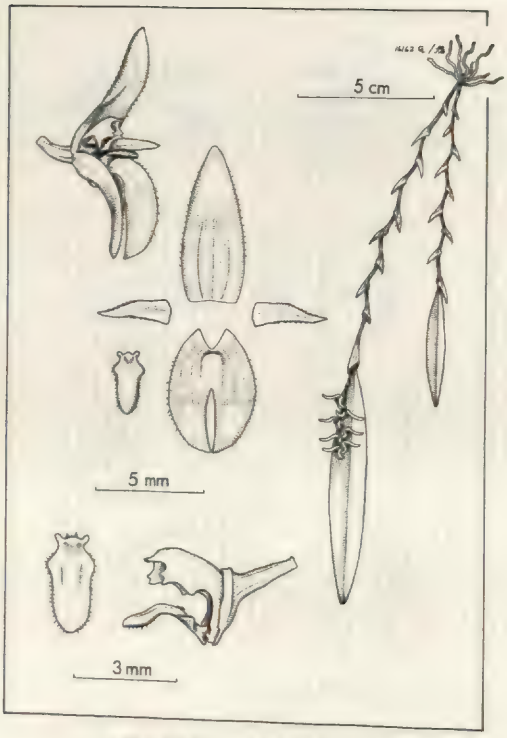

Fig. 17. Trichosalpinx patula

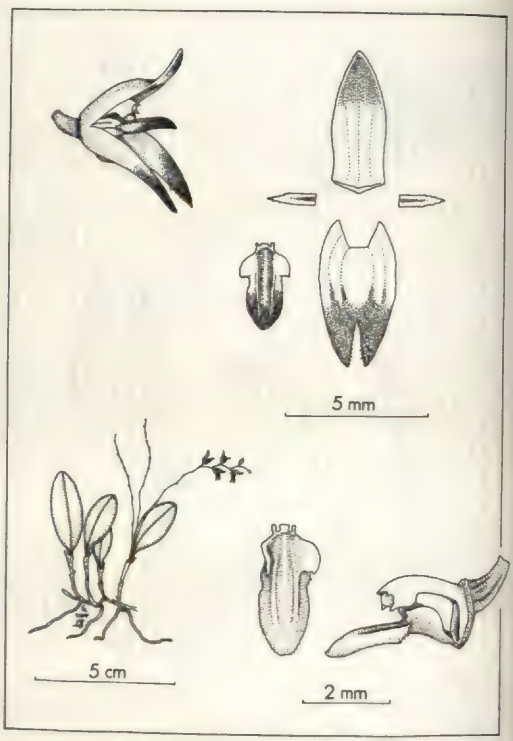

Fig. 18. Trichosalpinx pringlei

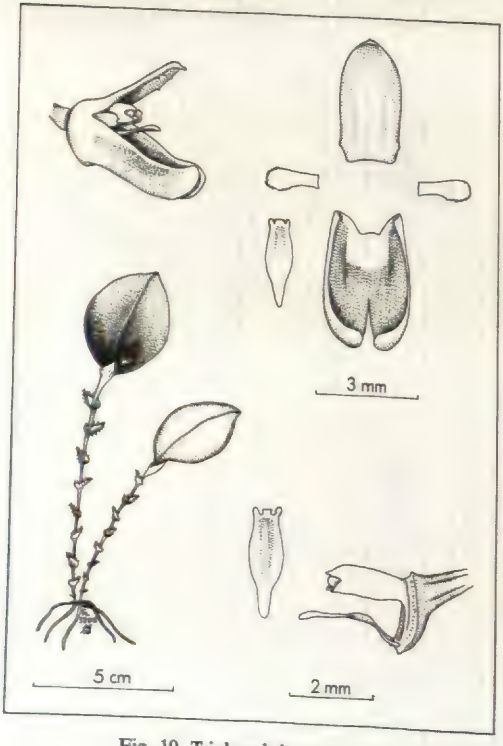

Fig. 19. Trichosalpinx psilantha

Fig. 20. Trichosalpinx ringens

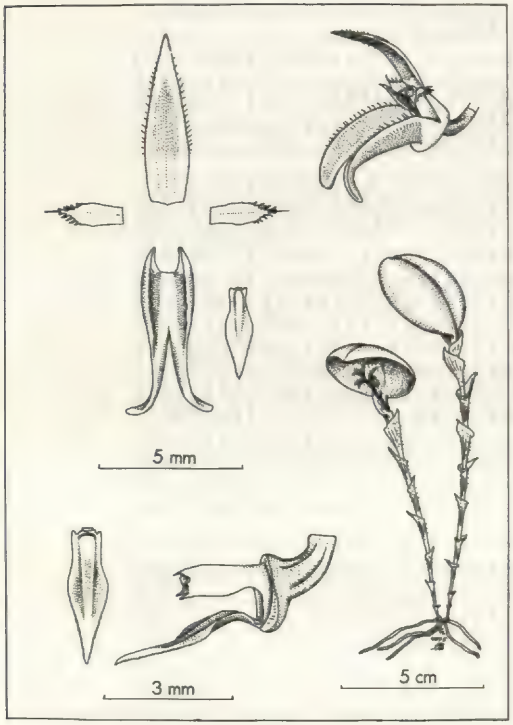

Fig. 21. Trichosalpinx rotundata

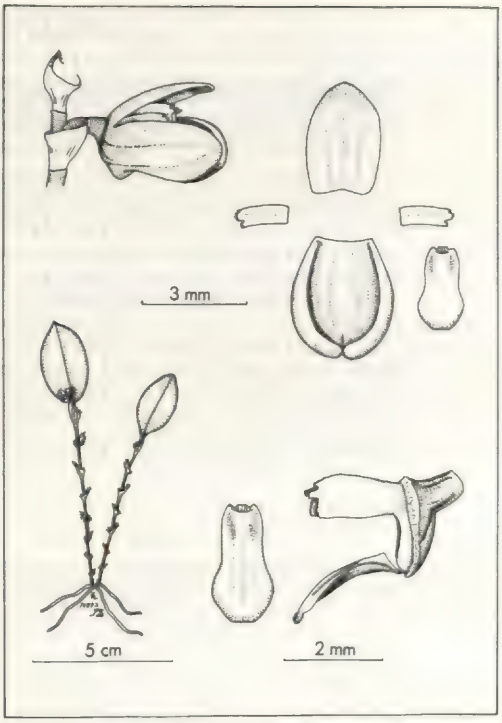

Fig. 22. Trichosalpinx trachystoma

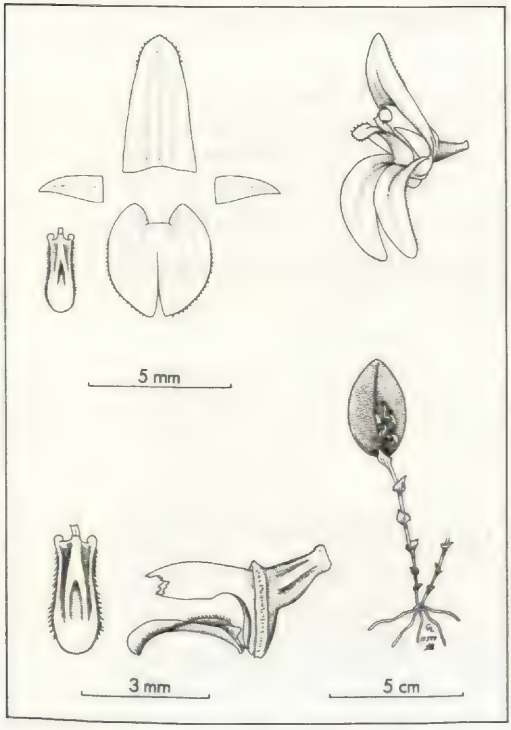

Fig. 23. Trichosalpinx triangulipetala

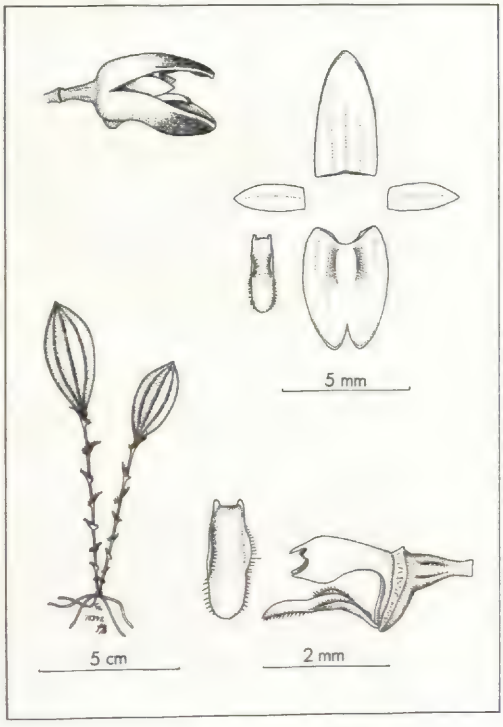

Fig. 24. Trichosalpinx vasquezii

SUBGENUS *TUBELLA*

Trichosalpinx acremona (Luer) Luer, Phytologia 54: 394, 1983. Fig. 25.

Bas.: *Pleurothallis acremona* Luer, Selbyana 5: 157, 1979.

Ety.: From the Greek *acremon*, "a branch," in allusion to the branching habit.

Plant small to medium in size, epiphytic, prolific, branching, erect to suberect, up to 15 cm or more tall; roots slender at the base. Ramicauls ascending, slender, producing another ramical from the apex, 0.5-9 cm long (the lower ramicauls much the longer), enclosed by 2-8 minutely ciliate, lepanthiform sheaths. **Leaf** ascending, thickly coriaceous, narrowly elliptical, acute, 1-3 cm long, 2-3 mm wide, contracted below into a petiole 1-3 mm long. **Inflorescence** a loose, subflexuous, simultaneously several-flowered raceme 2-5 cm long including the filiform peduncle 0.5-1.5 cm long, from near the apex of a ramicaul; floral bracts 1-1.5 mm long; pedicels 2-7 mm long; ovary 0.5-1 mm long; **sepals** pale yellow or pale green, glabrous, carinate, the dorsal sepal narrowly ovate, acute, more or less slightly acuminate, concave, 5-9.5 mm long, 1-2.25 mm wide, 3-veined, connate to the lateral sepals for 0.25-0.5 mm, the lateral sepals narrowly triangular, oblique, 5.5-9 mm long, 1-1.5 mm wide, each 1-veined; **petals** elliptical, acute with more or less minutely irregular margins, 2.5-3 mm long, 1 mm wide, 1-veined; **lip** yellow-green, ovate-trilobed, 2.75-3.25 mm long, 2-2.5 mm wide across the lobes, the apical lobe oblong with the apex rounded and thickened, cellular-glandular, the lateral lobes below the middle, erect, oblique, subacute, antrorse with the anterior margin irregular, the disc featureless, the base subtruncate, hinged to the column-foot; **column** terete, 1.5-2 mm long, with acute, antrorse, apical wings, the foot 1 mm long, the anther subapical, the stigma ventral.

ECUADOR: without locality, collected by Janet Kuhn in 1974, flowered in cultivation at J & L Orchids, Easton, CT, 1 Nov. 1975, *C. Luer 596* (Holotype: SEL). Prov. of Bolívar: epiphytic in wet forest west of Salinas, alt. 1150 m, 21 Mar. 1991, *C. Luer, J. Luer, A. Hirtz, X. Hirtz, J. del Hierro & M. & F. Navarro 15009* (MO). Prov. of Azuay: road banks north of Sevill de Oro, alt. 2800 m, 11 Sept. 1976, *B. Øllgaard & H. Balslev 9335* (AAU, NY). Prov. of Pichincha: above Tandapi, alt. 2600 m, March 1983, *A. Hirtz 1269* (MO). Prov. of Zamora-Chinchipe: cloud forest south of Yangana above Valladolid, alt. 2400 m, Sept. 1980, *C. Luer, J. Luer et al. 5606* (SEL); same area, alt. 2450 m, 23 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10930* (MO).
COLOMBIA: Dept. of Antioquia: Munic. of Yarumal, El Oro, alt. 1700 m, collected by R. Escobar & E. Valencia, flowered in cultivation at Colomborquídeas, 5 Mar. 1989, *C. Luer 14111* (MO).
BOLIVIA: Dept. of Cochabamba: Chapare, collected by M. MacDiarmid, flowered in cultivation 26 Feb. 1980, *C. Luer 5202* (SEL).

This species occurs on the eastern declivities of the Andes from Colombia into Bolivia, but it has not yet been identified from Peru. It is distinguished by the branching, prolific ramicauls that bear narrowly elliptical leaves. The flowers are produced simultaneously in racemes longer than the leaf. The sepals are free and narrowly acute, and the lateral lobes of the lip are large, erect and antrorse with an irregular margin. There is no callus.

Trichosalpinx acremona is similar to *T. cedralensis*, but the former is distinguished by the usually larger flowers; tall, oblique, lateral lobes of the lip with the anterior margins of the lobes irregular; and antrorse, apical wings of the column.

Large vegetative and floral forms of *T. acremona* appear similar to *T. vagans* of Colombia and *T. dunstervillei* of Venezuela, but the latter two are distinguished by the low, lateral lobes of the lip with tall keels on the disc.

Trichosalpinx alabastra (Luer & Escobar) Luer, Phytologia 54: 394, 1983. Fig. 26.

Bas.: *Pleurothallis alabastra* Luer & Escobar, Orquideología 16: 17, 1983.

Ety.: From the Latin *alabastra*, "unopened flowers," referring to the cleistogamous flowers.

Plant small to medium in size, up to 20 cm tall exclusive of the inflorescence, epiphytic to terrestrial, caespitose, branching above; roots slender. Ramicauls erect to suberect, slender, prolific, 3-8 cm long, enclosed by 2-6 closely appressed, ribbed lepanthiform sheaths with minutely ciliate ostia. **Leaf** erect, coriaceous, elliptical, acute, 2.5-4 cm long including the petiole 3-4 mm long, 8-12 mm wide,

cuneate below into the petiole. **Inflorescence** a subdense, secund, simultaneously several-flowered raceme 3-7 cm long including the peduncle 1-2 cm long, from near the apex of a ramicaul; floral bracts 1.5-2 mm long; pedicels 3-4 mm long; ovary 3-winged, 1-1.5 mm long; **sepals** yellow-white with a prominent orange mentum, glabrous, carinate, usually not parted, the dorsal sepal narrowly ovate-triangular, acute, 7.5 mm long, 2.5 mm wide, 3-veined, the lateral sepals free, narrowly triangular, oblique, acute, 7 mm long, 2 mm wide, 1-veined; **petals** white, cellular-glandular, elliptical, obtuse, 2.3 mm long, 0.8 mm wide, 1-veined; **lip** yellow-green, oblong, arcuate, 3 mm long, 1.5 mm wide, cellular-glandular, with obtuse marginal angles below the middle, the apex rounded, the disc with a low, longitudinal pair of calli, the base subtruncate, hinged to the column-foot; **column** greenish white, stout, 1.5 mm long, with broad, prominent, subacutely angled wings above the middle, the foot equally long, the anther subapical, the stigma ventral.

COLOMBIA: Dept. of Santander: terrestrial on the road embankment between Bucaramanga and Berlin, alt. 2600 m, 27 Apr. 1982, *C. Luer, J. Luer, R. Escobar & D. Portillo 7614* (Holotype: SEL); same locality, alt. 2370 m, 5 Nov. 1981, *C. Luer & R. Escobar 6552* (COL, SEL). Dept. of Antioquia: El Carmen above San Lorenzo, alt. 2500 m, 21 Mar. 1989, *C. Luer, J. Luer & W. Teague 14343* (MO). Dept. of Tolima: epiphytic on southern slopes of Nevado del Tolima, alt. 2600 m, 21 Apr. 1982, *C. Luer, J. Luer, R. Escobar & D. Portillo 7499* (JAUM, SEL).

This cleistogamous species, usually found growing on road embankments in the Central Cordillera and the Eastern Cordillera of Colombia seems never to be without flowers. Only occasionally will the sepals partially part. Apparently all flowers develop capsules. Superficially, *T. alabastra* appears similar to a small plant of *T. robledorum* in bud. It is distinguished from the latter by the much smaller flowers, glandular petals, and a lip that is oblong instead of subquadrate. The deeply winged columns of the two species are similar.

Trichosalpinx amygdalodora (Kraenzl.) Luer comb. nov. Fig. 27.

Bas.: *Pleurothallis amygdalodora* Kraenzl., Bot. Jahrb. Syst. 37: 521, 1906.

Ety.: From the Latin *amygdalodorus*, "smelling like an almond," an odor Kränzlin apparently had detected from the herbarium specimen.

Syn.: *Pleurothallis pyxos* Luer & Escobar, Orquideología 14: 168, 1981.

Ety.: From the Greek *pyxos*, "the shrub boxwood," in allusion to the habit of the plant.

Syn.: *Trichosalpinx pyxos* (Luer & Escobar) Luer, Phytologia 54: 397, 1983.

Plant parts very small to large and shrub-like, to over 1 meter or more high, terrestrial, erect, repent, branching, intermittently caespitose at apices of ramicauls; roots slender at the base or bases of superposed ramicauls. Ramicauls erect, stout to slender, proliferating, 2-5 cm long with 2-5 ciliate, lepanthiform sheaths, supporting ramicauls up to 30 cm long with 15 or more sheaths. **Leaf** erect, thickly coriaceous, oblong-elliptical, obtuse to rounded, 6-12 mm long, 4-9 mm wide, contracted below into a petiole 1-2 mm long. **Inflorescence** a loose, simultaneously few-flowered raceme 1.5-2.5 cm long including the peduncle ca. 1 cm long, from near the apex of a ramicaul; floral bracts 1.5-2 mm long; pedicels 2 mm long; ovary 0.75 mm long; **sepals** white to pale yellow, glabrous, carinate, the dorsal sepal ovate, acute, long acuminate, concave below, 4-8 mm long, 2-2.5 mm wide, 3-veined, the lateral sepals narrowly triangular, oblique, acute, attenuate, 3.5-8 mm long, 0.75-1 mm wide, connate 1-2 mm, each 1-veined; **petals** membranous, elliptical, acute, 2-2.5 mm long, 1 mm wide, 1-veined; **lip** yellow, oblong-subtrilobed, 2.5-3 mm long, 1-1.25 mm wide, the apical two-thirds oblong with the apex rounded, the basal third with broadly rounded, erect, lateral lobes, the disc with a rounded callus near the anterior margin of the lobes, the base truncate, hinged to the column-foot; **column** terete, 1 mm long, the anther subapical, the stigma ventral, with the foot obsolescent.

PERU: Dept. of Cajamarca: Hualgayoc, valley of Taolis, alt. 2800 m, *Weberbauer 1824* (holotype of *P. amygdalodora* presumably destroyed at B, neotype here designated): Hualgayoc, alt 3000 m, 1 Sept. 1964, *P. C. Hutchison & K. von Bismarck 6425* (Neotype: AMES; Isoneotypes: F, K, M, MICH, MO, NY, P, UC, US, USM).

ECUADOR: Prov. of Carchi: between El Playón and Santa Bárbara, alt. 3400 m, 20 Mar. 1921, *C. Luer, J. Luer & A. Hirtz 15211* (MO); El Mirador, between Julio Andrade and Playón de San Francisco, alt. 3300 m, 22 Mar. 1991, *A. Hirtz, X. Hirtz, J. Del Hierro & S. Ortega 5290* (MO). Prov. of Napo: on lava bed near Papallacta, alt. 3100-3300 m, 15 June 1968, *G. Harling, G. Storm & B. Ström 10348* (AMES, GB). Prov. of Tungurahua: slopes of Volcán Tungurahua above Baños, alt. 3000 m, 27 Mar. 1984, *C. Luer, S. Dalström, T. Höijer, F. Freire & J. Kuijt 9670* (MO).

COLOMBIA: Dept. of Cauca: San Sebastian, epiphytic in cold, cloud forest between La Vega and Páramo de Barbillas, alt. 3070 m, 27 July 1978, *C. Luer, J. Luer, J. Kuhn & R. Escobar 3047* (holotype of *T. pyxos*: SEL): Páramo de Moras, alt. 3000-3400 m, 16 Mar. 1884, *F. C. Lehmann 3752* (G); Cabeceras del Río Palo, alt. 3300 m, 1 Dec. 1949, *J. Cuatracasas 18820* (AMES).

Large specimens of this species resemble dense, small-leaved shrub. It grows terrestrially in cold forests at altitudes around 3000 meters above sea level from southern Colombia into northern Peru. It had been collected by both Lehmann in Colombia and Weberbauer in Peru in the nineteenth century. Weberbauer's collection was no doubt merely a terminal fragment of a much larger plant.

Although the supporting ramicauls are long and stout, the majority of the prolific, branching ramicauls are short and crowded. The inflorescence consists of an inconspicuous, few-flowered raceme of small, whitish flowers. The sepals are long-acuminate and the lip is three-lobed with a pair of calli at the front margin of the lateral lobes as seen in many allied species.

Trichosalpinx arbuscula (Lindl.) Luer, Phytologia 54: 394, 1983. Fig. 28., 29.

Bas.: *Pleurothallis arbuscula* Lindl., Edwards' Bot. Reg. 28: misc. 72, 1842.
Ety.: From the Latin *arbusculus*, "a little tree," in allusion to the tall, branching habit.

Syn.: *Pleurothallis dinotherii* Rchb.f. & Warsc., Bonplandia 2: 114, 1854.
Ety.: From the Greek *dinotherion*, "a frightful animal." *Dinotherium*, an extinct, proboscidean mammal with down-turned tusks, in allusion to the recurved lateral sepals.

Syn.: *Pleurothallis diptera* Lindl., Folia Orchid. *Pleurothallis* 44, 1859.
Ety.: From the Greek *dipteros*, "two-winged." referring to the column.

Syn.: *Pleurothallis moschata* Rchb.f., Xenia Orchid. 3: 42, t. 217, 1881.
Ety.: From the Latin *moschatus*, "musk-scented," referring to the odor of the flowers.

Syn.: *Humboldtia arbuscula* (Lindl.) Kuntze, Rev. Gen. Pl. 2: 667, 1891.

Syn.: *Humboldtia dinotherii* (Rchb.f.) Kuntze, Rev. Gen. Pl. 2: 667, 1891.

Syn.: *Humboldtia diptera* (Lindl.) Kuntze, Rev. Gen. Pl. 2: 667, 1891.

Syn.: *Pleurothallis lepanthoides* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 7: 106, 1920.
Ety.: Named for the similarity of the species to the genus *Lepanthes*.

Syn.: *Pleurothallis tricaudata* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 9: 77, 1921.
Ety.: From the Latin *tricaudatus*, "three-tailed," referring to the flowers.

Syn.: *Trichosalpinx dinotherii* (Rchb.f.) Luer, Phytologia 54: 395. 1983.

Syn.: *Trichosalpinx moschata* (Rchb.f.) Luer, Phytologia 54: 396. 1983.

Syn.: *Trichosalpinx arbusculoides* (Hashimoto) Luer, Phytologia 54: 394, 1983.
Bas.: *Pleurothallis arbusculoides* Hashimoto, Bull. Natl. Sci. Mus. 4: 9, 1978.
Ety.: Named for the similarity to *P. arbuscula* Lindl.

Plant medium to large in size, robust to weak, up to 40 cm tall exclusive of the inflorescence, epiphytic to terrestrial, caespitose, branching above; roots slender. Ramicauls erect, suberect or ascending, slender to relatively stout, prolific, 3-20 cm long, enclosed by 3-10 closely appressed, ribbed lepanthiform sheaths with minutely ciliate ostia. **Leaf** erect, coriaceous, elliptical, acute to subacute, 2-5.5 cm long including the petiole up to 1 cm long, 1-1.8 cm wide, cuneate below into the petiole. **Inflorescence** a subdense, subsecund, simultaneously several-flowered raceme 5-15 cm long including the peduncle 2-5 cm long, from near the apex of a ramicaul; floral bracts 2-4 mm long; pedicels 2.5-6 mm long; ovary 1-1.5 mm long; **sepals** yellow to yellow-orange, often suffused with brown or purple along the veins, glabrous, carinate, the dorsal sepal narrowly ovate, concave basally, acute, attenuate, 9-15 mm long, 2-3 mm wide, 3-veined, connate to the lateral sepals for 0.5 mm, the lateral sepals free, narrowly linear-triangular, oblique, acute, attenuate, 9-13 mm long, 1.5 mm wide, 1-veined; **petals** elliptical, acute to obtuse, 1.75-2 mm long, 1-1.25 mm wide, 1-veined; **lip** yellow, sometimes suffused with red or brown, elliptical-oblong, arcuate, 2.5-3.5 mm long, 1-1.3 mm wide, the apex obtuse to rounded, the disc with a pair of longitudinal calli with the midvein more or less thickened between, the base rounded, hinged to the column-foot; **column** green, stout, 1.5-2 mm long, with broad, prominent wings above the middle, the foot equally long, the anther subapical, the stigma ventral.

ECUADOR: Prov. of Loja: near Loja, *Th. Hartweg 37* (Holotype: K, Isotypes: AMES, LD, W); Parqué Nacional Podocarpus, alt. 2850-2950 m, 21 Feb. 1985, *B. Øllgaard et al. 57917* (AAU); epiphytic at the

pass north of Loja, alt. 2700 m, 2 Feb. 1987, *C. Luer, J. Luer & A. Hirtz 12582* (MO); above Yangana, alt. 2400 m, 23 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10887* (MO). Prov. of Carchi: terrestrial on the road embankment east of the pass east of Maldonado, alt. 2500 m, 15 Jan. 1992, *C. Luer, J. Luer, P. Jesup & A. Jesup 16041* (MO). Prov. of Morona-Santiago: between Limón and Gualaceo, alt. 1900-2000 m, 22 Mar. 1974, *G. Harling & L. Andersson 12744* (GB); epiphytic east of the pass between Gualaceo and Limón, alt. 2750 m, 16 Feb. 1986, *C. Luer, J. Luer, A. Hirtz, W. Flores & A. Embree 11825* (MO); same area, alt. 2150 m, 14 Jan. 1989, *C. Luer, J. Luer, P. Jesup, A. Jesup, A. Hirtz & S. Ortega 13883* (MO); epiphytic east of the pass east of Sigsig, alt. 2700 m, 15 May 1988, *C. Luer, A. Hirtz, W. Flores, A. Andreetta & W. Teague 13346* (K, MO). Prov. of Napo: epiphytic in Guacamayo range, alt. 1950 m, 13 Apr. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 11246* (MO). Prov. of Pichincha: forest on the road to Nanegal, *W. Jameson s.n.* (holotype of *P. diptera*: W; isotype: K); near Nono and Tandayapa, alt. 2250 m, 16 June 1987, *C. H. Dodson & M. Chase 17192* (MO); Pululagua north of Quito, alt. 3000 m, 11 Nov. 1984, *A. Hirtz 2093* (MO). Prov. of Zamora-Chinchipe: above Valladolid, alt. 2450 m, 23 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10923* (MO); south of the pass between Jimbura and Zumba, alt. 2800 m, 24 Jan. 1986, *S. Dalström & T. Höijer 1096* (MO).
COLOMBIA: Dept. of Antioquia: epiphytic in forest remnant north of Santa Rosa de Osa, alt. 2580 m, 14 Mar. 1989, *C. Luer, J. Luer, S. Dalström & W. Teague 14150* (MO); Sonsón, collected by E. Valencia, flowered in cultivation at Colomborquídeas, 16 May 1993, *C. Luer 16871* (MO). Dept. of Cundinamarca: Monserrate-Kette, alt. 2800 m, 28 May 1939, *J. Renz 3623* (AMES; Herb J. Renz); Bogotá, Quebrada del Chico, alt. 2800-3800 m, 20 Feb. 1944, *M. Schneider 169* (S). Dept. of Cauca: without locality, *Madero s.n.* (holotype of *P. lepanthoides* presumably destroyed at B, true identity in doubt).
VENEZUELA: tall forest north of Nirgua, alt. 4000 ft., Jan. 1964, *G. C. K. Dunsterville 831*.
PANAMA: Prov. of Chiriquí: Fortuna dam site, collected by R. L. Dressler Oct. 1976, flowered in cultivation Nov. 1976, *C. Luer 060* (SEL); same area, alt. 1025, 24 Mar. 1978, *B. Hammel 2295* (MO); between Fortuna dam and the continental divide, alt. 1150 m, 24 Oct. 1985, *G. McPherson 7319* (MO).
PANAMA: Prov. of Chiriquí: near "Vivero" south of Fortuna dam site, Valle de Hornito, 10 May 1982, *R. L. Dressler 6046* (MO). Prov. of Veraguas: 5 Sept. 1976, *C. Luer & H. Butcher 1139A* (SEL). Prov. of Coclé: upper Río Blanco, NW of El Copé, alt. 600-800 m, 26 Dec. 1980, *R. L. Dressler 5983* (MO).
COSTA RICA: Without locality, ca. 1867, *A. Endres 2653* (holotype of *P. moschata*: W). Prov. of Alajuela: La Virgen del Soccorro, alt. 800 m, 10 Oct. 1978, *C. Todzia 479* (CR). Prov. of Cartago: Orosi, Paraíso, alt. 1400 m, 21 Dec. 1992, *G. Herrera 5816* (CR, K). Prov. of Heredia: Parqué Nacional Braulio Carrillo, between Río Peje and Río Sardinalito, alt. 700-800 m, 14 Nov. 1986, *M. Grayum & G. Herrera 7902* (MO); Parqué Nacional Braulio Carrillo, Zurquí Station, alt. 1650 m, 26 Oct. 1990, *S. Ingram & K. Farrell 631* (CR, SEL); Prov. of Cartago: Paraíso, Orosí, Parqué Nacional Tapantí, alt. 1400 m, 21 Dec. 1992, *G. Herrera 5816* (K). Prov. of San José: Cordillera de Talamanca, north of San Isidro del General, alt. 2100 m, 15 May 1956, *L. O. Williams 19992* (SEL).
PERU: Dept. of Amazonas: Chachapoyas, shady banks, *R. Spruce 3181* (K); Luya, Tullanga, Cerro Huicsocunga o Condorpuna, alt. 3310 m, 6 Sept. 1989, *C. Díaz & J. Campos 3803* (MO). Dept. of Cuzco: Paucartambo, Pte. del Aguila, alt. 2800 m, 4 Nov. 1965, *C. Vargas 16757* (AMES). Dept. of Huánuco: between Chinchao and Acomayo west of Huallaga, alt. 3100-3200 m, Sept. 1913, *A. Weberbauer 6827* (holotype of *P. tricaudata* presumably destroyed at B, lectotype here designated: AMES; isolectotypes: MOL, US). Without locality, *Warscewicz s.n.* (holotype of *P. dinotherii*: W).
BOLIVIA: Dept. of Cochabamba: Chapare, Pampatambo, to Ende Planta Corani, northeast of Cochabamba, 7 Dec. 1974, *Nishida, Ono, Hashimoto & Ohga 01043* (holotype of *T. arbusculoides*: TNS).

Some specimens of this species attain the largest size known in the genus. Tall, leafy "stems" stand in clumps and bear long racemes of numerous flowers with long-attenuate sepals that often recurve. Plants differ markedly in size of the leaves and height of the ramicauls, but, except for the lengths of the sepals, the morphology of the floral parts is surprisingly constant. Smaller plants suggest a transition into another widely distributed sympatric species-complex, *T. dura*. The entire, longitudinally tricallous lip is similar in both concepts.

Trichosalpinx arbuscula is relatively frequent in Ecuador, but it occurs locally as far north as Costa Rica and into Bolivia in the Andes. Collections from Central America known as *T. moschata* (Fig. 29.) are not specifically different from those of the Andes, although the habit is smaller. However, equally small plants are not uncommon in the Andes.

Schlechter's *Pleurothallis lepanthoides* was probably a small specimen of *T. arbuscula*. Unfortunately, it was a Madero collection that was lost at B. *Trichosalpinx arbusculoides* probably represents this species in Bolivia. The only distinguishing feature is the pair of basal lobes of the lip. Similar, but lower basal lobes have been seen among collections from Ecuador.

Trichosalpinx atropurpurea Luer & Hirtz, sp. nov. Fig. 30.

Ety.: From the Latin *atropurpureus*, "purple," in reference to the color of the flowers.

Planta mediocris caespitosa, ramicaulibus saepe proliferantibus, racemis paucis coaetaneis secundis pauciflorisfolio parvo elliptico longioribus, sepalis atropurpureis glabris ovatis acutis, petalis ellipticis acutis, labello oblongo subtrilobato, lobo antico oblongo apice rotundo, lobis lateralibus infra medium late obtusis.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls erect, superposed, comparatively stout, 6-12 cm long, enclosed by 8-11 lepanthiform sheaths with ciliate ostia. **Leaf** erect to suberect, thickly coriaceous, elliptical, subacute to obtuse, 10-23 mm long, 6-10 mm wide, contracted below into a petiole 2-3 mm long. **Inflorescence** several, simultaneous, secund, loose, few-flowered racemes 2-3 cm long including the peduncle 0.5-1 cm long, from near the apex of a ramicaul; floral bracts 2.5 mm long; pedicels 1 mm long; ovary 0.5 mm long; **sepals** deep red-purple, glabrous, subcarinate, the dorsal sepal ovate, acute, concave, 9.5 mm long, 3.25 mm wide, 3-veined, connate to the lateral sepals for 0.5 mm, the lateral sepals narrowly triangular, acute, oblique, 9.5 mm long, 1.5 mm wide, connate 2 mm, each 1-veined; **petals** elliptical, oblique, acute, 6 mm long, 2 mm wide, 1-veined; **lip** deep purple, oblong-ovate, subtrilobed, 6.5 mm long, 2.75 mm wide across the lobes, the apical portion oblong with the apex rounded, the lateral lobes low, broadly obtuse, below the middle, the disc featureless, the base narrowly truncate, hinged to the column-foot; **column** terete, 3 mm long, the anther subapical, the stigma ventral.

ECUADOR: Prov. of Loja: epiphytic in cloud forest above Jimbura, alt. 3350 m, 22 Mar. 1984, *C. Luer, A. Hirtz, S. Dalström, T. Höijer & J. Kuijt 9638* (Holotype: MO).

This species, known only from a high altitude of southernmost Ecuador, produces caespitose plants with erect ramicauls that are often prolific. Two to four short racemes of several, comparatively large, dark red-purple flowers are produced simultaneously. The petals and lip are large for the flower. The simple lip is obscurely lobed below the middle and the disc is featureless.

Trichosalpinx atropurpurea is one of three distinct species of the genus found at the high, cold, wind-swept pass east of Jimbura near the Peruvian border. The others are *T. jumburae* and *T. metamorpha*. All three are apparently endemic in this area, not having been found at a similar nearby pass south of Yangana.

Trichosalpinx barbelifera Luer & Vásquez, sp. nov. Fig. 31.

Ety.: From the Latin *barbelifer*, "bearing barbels," referring to the long tails of the sepals.

Species haec *T. arbusculae* (Lindl.) Luer affinis, sed habitu repenti, sepalis rubrovittatis longissime caudatis differt.

Plant medium to large, epiphytic, long-repent, up to 40 cm long, branching; roots slender. Ramicauls erect, prolific, slender, 1-8.5 cm long, enclosed by 3-5 closely appressed, ribbed lepanthiform sheaths with minutely ciliate ostia. **Leaf** erect, coriaceous, elliptical, acute, 2-4 cm long including the petiole 5-8 mm long, 0.8-1.5 cm wide, cuneate below into the petiole. **Inflorescence** a loose, secund, simultaneously several-flowered raceme 8-15 cm long including the peduncle 2-4 cm long, from near the apex of a ramicaul; floral bracts 2-3 mm long; pedicels 5-10 mm long; ovary 1 mm long; **sepals** white with purple stripes along the veins, glabrous, carinate, the dorsal sepal narrowly ovate, concave basally, acute, long-attenuate, 20-27 mm long with the tail yellow-green, 2.25 mm wide above the base, 3-veined, the lateral sepals free, narrowly ovate-sigmoid, oblique, acute, long-attenuate, 20-27 mm long, 1.5 mm wide, near the base, 2-veined; **petals** elliptical, acute, 3 mm long, 1.25 mm wide, 1-veined; **lip** yellow, elliptical-ovate, arcuate, 3.5 mm long, 1 mm wide, the apex narrowly obtuse to rounded, the disc with a pair of longitudinal calli, the base subtruncate, hinged to the column-foot; **column** stout, 1.5 mm long, with broad, prominent wings above the middle, the foot 2 mm long, the anther subapical, the stigma ventral.

BOLIVIA: Dept. of La Paz: Nor Yungas, epiphytic in steep forest east of Chuspipata, alt. 2750 m,24 Nov. 1992, *C. Luer, J. Luer, R. Vásquez, D. Ric & W. Teague 16489* (Holotype: MO). Dept. of Cochabamba: Chapare, northeast of Cochabamba toward Villa Tunari, alt. 2600 m, 30 Nov. 1978, *C. Luer, J. Luer, F. Fuchs et al. 3586* (SEL).

This species is apparently confined to the cool, wet forests of Bolivia. It is closely related to the widely distributed *T. arbuscula*, but it is distinguished by the weak habit. A long, flexuous stem of superposed ramicauls with leaves at intervals creeps in loose accumulations of mossy litter. Racemes of several, very long-tailed flowers are produced. The sepals are white with purple stripes along the veins, and the long, filamentous tails are yellow-green. The small, acute petals, and the longitudinally callous, entire lip and column are similar to those of *T. arbuscula*.

Trichosalpinx carinilabia (Luer) Luer, Phytologia 54: 394, 1983. Fig. 32.

Bas.: *Pleurothallis carinilabia* Luer, Selbyana 3: 256, 1977, nec *P. tricarinata* Poepp. & Endl. 1836 nec H.Focke 1853.

Ety.: From the Latin *carinilabius*, "with a carinate lip," referring the tricarinate labellum.

Syn.: *Pleurothallis broadwayi* Ames var. *tricarinata* C.Schweinf., Bot. Mus. Leafl. 8: 42, 1940.

Ety.: From the Latin *tricarinatus*, "tricarinate," referring to the tricallous lip.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect to suberect, prolific, usually 2-3 superposed, each 4-11 mm long, enclosed by 2-4 ciliate, lepanthiform sheaths. **Leaf** erect, thickly coriaceous, elliptical, subacute to obtuse, 8-10 mm long, 5-6.5 mm wide, contracted below into a petiole 1 mm long. **Inflorescence** a loose, successively few-flowered raceme, up to 25 mm long, including the filiform peduncle 10-12 mm long, from near the apex of the ramicaul; floral bracts 1 mm long; pedicels 2-3 mm long; ovary 0.4 mm long; **sepals** white, glabrous, carinate, the dorsal sepal ovate, concave, acute, 2.75-4 mm long, 1.25 mm wide, 3-veined, the lateral sepals free, ovate-triangular, oblique, acute, 2.5-4 mm long, 1 mm wide, 1-veined; **petals** translucent yellow, obovate, obtuse, 1.5 mm long, 0.75 mm wide, 1-veined; **lip** white, thick, elliptical-oblong, 2 mm long, 0.8 mm wide, slightly arcuate with the margins broadly rounded, the apex thick, convex, cellular-glandular, obtuse, the disc with a pair of low, parallel calli within the margins just above the middle, with a thickened midvein or third low, callus between, the base subtruncate, hinged to the column-foot; **column** terete, shallowly winged near the apex, 1 mm long, with a foot 0.5 mm long, the anther subapical, the stigma ventral.

COSTA RICA: Prov. of Alajuela: Palmira, epiphyte on oak, alt. 2000 m, 27 May 1938, *A. Smith H 668* (Holotype: AMES); same area, alt. 2200 m, 9 May 1938, *A. Smith 532* (AMES); same area, alt. 2000 m, 16 May 1938, *A. Smith 589* (AMES); between Palmira and Alfaro Ruiz, alt. 1840 m, 4 July 1925, *A. M. Brenes 1325* (AMES). Prov. of Cartago: Cordillera de Talamanca, near Congreja above El Tejar, alt. 1800 m, 11 May 1986, *L. O. Williams 19854* (SEL). Prov. of Heredia: Poasito, slopes of Volcán Poás, alt 2200 m, 1 May 1979, *L. O. Williams 16652* (AMES). Prov. of Puntarenas: Monteverde, alt. 1420, 6 June 1989, *J. T. Atwood 89-124* (MO, SEL); same area, 14 Mar. 1989, *J. T. Atwood 89-74* (CR); in pasture near Monteverde Reserve, alt. 1500 m, 21 Mar. 1995, *C. Luer, J. Luer, J. Atwood, G. Barbosa & W. Rhodehamel 17454* (MO). Without locality, ca. 1867, *A. Endres s.n.* (W).
PANAMA: Prov. of Chiriquí: north of San Felix, Cerro Colorado copper mine road, alt. 5000-5500 ft., 6 May 1975, *S. Mori & J. Kallunki 5996* (MO, SEL); near Cerro Colorado, near Chami camp, alt. 1500 m, 16 Apr. 1986, *G. McPherson 8959* (MO).

Superficially, this little species, already collected by Endres in the nineteenth century, is similar to *T. dura* (long-known as *P. foliata* or *P. broadwayi* in the Caribbean and Central America), and it was originally described as variety *tricarinata* of *P. broadwayi*. When it was elevated to the rank of species in 1976, a new name was proposed, because the epithet *tricarinata* was already occupied in the genus *Pleurothallis*.

Trichosalpinx carinilabia, in habit more or less caespitose, is distinguished by occasionally prolific ramicauls that bear in succession only one or two others. The few-flowered racemes of successive, white flowers surpasses the leaf two to three times in length. The sepals are carinate; the petals are obtuse; the oblong lip bears three calli, a pair above the middle and a third in the center, and the apex is abruptly very thick and convex, and sharply concave below between the lateral calli. The column lacks the broad apical wings seen in *T. dura*.

Trichosalpinx cedralensis (Ames) Luer, Phytologia 54: 394, 1983. Fig. 33.

Bas.: *Pleurothallis cedralensis* Ames, Sched. Orchid. 4: 18, May 1923.
Ety.: Named for the community of Cedral, Costa Rica, where this species was discovered.

Syn.: *Pleurothallis myrtillus*, Schltr., Repert. Spec. Nov. Regni Veg. Beih. 19: 108, Nov. 1923.
Ety.: From the Latin *myrtillus*, "a plant of the Myrtaceae," in allusion to the habit.

Plant small, epiphytic, prolific, branching, erect to suberect, up to 10 cm or more tall; roots slender at the base. Ramicauls ascending, slender, producing another ramical from the apex, 0.5-3 cm long (the lower ramicauls much the longer), enclosed by 2-6 microscopically ciliate, lepanthiform sheaths. **Leaf** ascending, thickly coriaceous, elliptical, subacute, 8-11 mm long, 3-5 mm wide, contracted below into a petiole 1 mm long. **Inflorescence** a loose, flexuous, subsecund, simultaneously several-flowered raceme 2-3 cm long including the filiform peduncle 5-8 mm long, from near the apex of a ramicaul; floral bracts 1 mm long; pedicels 1.5-2 mm long; ovary 0.5 mm long; **sepals** pale yellow, glabrous, carinate, the dorsal sepal ovate-triangular, acute, more or less slightly acuminate, concave, 4.75-5.5 mm long, 1.75 mm wide, 3-veined, connate to the lateral sepals for 0.5 mm, the lateral sepals narrowly triangular, oblique, 4.5-5.5 mm long, 1 mm wide, each 1-veined; **petals** elliptical, oblique, acute, 2.5-3 mm long, 0.8-1 mm wide, 1-veined; **lip** yellowish, oblong-trilobed, 2.5-3.5 mm long, 1.25-1.5 mm wide across the lobes, the apical lobe oblong with the apex rounded and thickened, cellular-glandular, the lateral lobes erect, oblique, obtuse with the anterior margin truncate, the disc featureless, the base truncate, hinged to the column-foot; **column** terete, 1.5 mm long, with small, obtuse, apical wings at the apex, the foot 1 mm long, the anther subapical, the stigma ventral.

COSTA RICA: Prov. of Cartago; Cedral, alt. 5000 ft., 28 July 1919, *C. H. Lankester 352* (Holotype: K); without locality, ca. 1867, *A. Endres 33, 283, 287* (W); San Ramón, Candelaria, alt. 5000 ft., ca. 1869, *A. Endres 262* (W); La Estrella, Jan. 1923, *C. H. Lankester & A. Sancho 399* (AMES); Cachi, Nov. 1916, *C. H. Lankester 80* (AMES, K); La Palma, alt. 1800 m, Dec. 1908, *A. & C. Brade 1106* (holotype of *P. myrtillus* presumably destroyed at B; lectotype here designated: AMES 28789, illustr. of type); La Palma, Nov. 1897, *S. Wercklé 11592* (CR); Río Grande de Orosi, alt. 1220 m, 1 Jan. 1970, *R. W. Lent 1812* (CR); Tapantí, alt. 1300 m, 20 Aug. 1992, *J. F. Morales, V. Nilsson & R. Chacón 403* (CR, MO). Prov. of Alajuela: San Ramón, alt. 1050 m, Nov. 1921, *A. M. Brenes 23* (AMES, CR); La Palma, alt. 1190 m, 23 Nov. 1922, *A. M. Brenes 473* (CR, AMES); El Silencio, alt. 750 m, 9 Oct. 1922, *A. M. Brenes 317* (AMES); San Ignacio, alt. 1150 m, 12 Sept. 1925, *A. Alfaro 177* (AMES). El Muñeco, Río Navarro, alt. 1400-1500 m, 6 Mar. 1926, *P. C. Standley & R. Torres 51301* (AMES); Santa Clara de Cartago, alt. 1950 m, 20 July 1923, *W. R. Maxon & A. D. Harvey 8122* (AMES); near San Ramón, alt. 1050 m, 23 Nov. 1923, *A. M. Brenes 23* (B?); Alfaro Ruiz, La Peña de Zarcero, 21 Oct. 1938, *A. Smith H-1279* (AMES); San Ramón, sendero Miramar, 2 Nov. 1986, *G. Herrera, V. Mora & D. Hernández 153* (CR, MO); San Ramón, Los Angeles, alt. 1000 m, 21 Oct. 1993, *G. Herrera 6628* (CR, K).Guanacaste: road to San Gerardo, alt. 1550-1600 m, 9 Dec. 1989, *W. Morris & J. Atwood 4034* (CR). Prov. of Guanacaste: Cordillera de Tilarán, between Río Chiquito and Santa Elena, alt. 1200 m, 30 Dec. 1985, *P. M. Catling & V. Brownell C18.4* (AMES, Canada); north of Santa Elena, alt. 1500 m, 20 Dec. 1985, *W. Haber & E. Bello 3811, 3868* (CR, MO); north of Monteverde to Las Nubes, alt. 1400 m, 10 Nov. 1988, *W. Haber & W. Zuchowski 8833* (CR, MO); north of Monteverde to Las Nubes, alt. 1450 m, 28 Jan. 1989, *W. Haber & W. Zuchowski 9027* (CR, MO). Prov. of Heredia: San Jeronimo, 1922, *C. Wercklé 150* (B?); Yerba Buena alt. 2000 m, 22 Feb. 1926, *P. C. Standley & J. Valerio 49051* (AMES); Parqué Nacionál Braulio Carrillo, alt. 2050 m, 20 Nov. 1990, *S. Ingram & K. Ferrell 740* (MO, SEL). Prov. of San José: La Hondura, alt. 1300-1700 m, 2 Mar. 1924, *P. C. Standley 36281 etc.* (AMES).
PANAMA: Prov. of Chiriquí: Monte Rey above Boquete, no alt., 21 July 1971, *T. Croat & D. Porter 15685* (MO).
VENEZUELA: Edo. Bolívar: Cerro Guaiquinima, Río Paragua, alt. 1650 m, 31 Dec. 1951, *B. Maguire 32858* (AMES, NY); Cerro Venamo, alt. 950-1150 m, 23 Dec. 1963, *J. A. Steyermark & G. C. K. Dunsterville 92352* (AMES, MO, VEN); Sierra Pakaraima, alt. 1400 m, 4 May 1973, *J. A. Steyermark 107310* (AMES); Cerro Marutani, alt. 1200 m, 11-14 Jan. 1981, *J. A. Steyermark et al. 123937* (MO, VEN). Terr. Fed. Amazonas: Atabapo, Cerro Marahuaca, alt. 1140 m, 21-24 Feb. 1985, *J. A. Steyermark & B. Holst 130463* (MO, VEN); Atabapo, Cerro de Marahuaca, alt. 1225 m, 19 Feb. 1985, *R. L. Liesner 17694* (MO, VEN); Atabapo, below Salto Los Monos, alt. 1500-1650 m, 12 Mar. 1985, *R. L. Liesner 18602* (MO).
ECUADOR: Prov. of Pastaza: near Mera, alt. 1100 m, 27 Feb. 1972, *G. Harling 11068* (GB). Prov. of Pichincha: west of Calacalí, alt. 2100 m, 4 Apr. 1985, *C. Luer, J. Luer, A. Hirtz, C. Dodson & P. Dodson 11034* (MO). Prov. of Tungurahua: slopes of Volcán Tungurahua, alt. 2800 m, Apr. 1986, *A. Hirtz 2881* (MO). Prov. of Morona-Santiago: epiphytic in forest along the new road between Macas and Guamote, alt. 1550 m, 16 Jan. 1989, *C. Luer, J. Luer, A. Hirtz, P. Jesup & A. Jesup 13931* (MO).
BOLIVIA: Dept. of Cochabamba: Chapare, northeast of Cochabamba toward Villa Tunari, alt. 1500 m, 17 Jan. 1988, *C. Luer, J. Luer, R. Vásquez, T. & D. Mulder & A. Vogel 12858* (MO); same area, alt. 1750

m, 31 Jan. 1997, *C. Luer, J. Luer, R. Vásquez, D. Ric & W. Teague 18344* (MO). Dept. of La Paz: Nor Yungas, NW of San Pedro through Incahuara-Mejillones, alt. 1500 m, 12 Feb. 1983, *J. C. Solomon 9486* (MO); Nor Yungas, north of Caranavi toward Alto Beni, alt. 1550 m, 26 Jan. 1988, *C. Luer, J. Luer, R. Vásquez, J. Solomon, T. & D. Mulder & A. Vogel 12943* (MO);

This little species is somewhat variable and relatively frequent in the mountains of Central America through the Andes from Venezuela into Bolivia. It is characterized by the branching habit with alternating leaves produced by short, prolific ramicauls. Sometimes a comparatively stout basal ramicaul is longer than the rest. The racemes of yellow flowers are twice to thrice as long as the leaves. The sepals and petals are acute. The lip is obtusely lobed up to the middle, and there is no callus at the anterior base of the lobes that distinguishes *T. intricata* and its relatives. The anterior lobe of the lip is oblong and obtuse.

Trichosalpinx cedralensis is similar to *T. acremona*, but the latter is distinguished by narrower leaves; more acuminate sepals; tall, antrose, labellar lobes with irregular, anterior margins; and descending wings at the apex of the column.

The flowers of *T. cedralensis* are similar to those of *T. multicuspidata*, but the latter is distinguished by the caespitose habit with taller non-proliferating ramicauls, and longer racemes.

Trichosalpinx chaetoglossa (Luer) Luer, Phytologia 54: 394, 1983. Fig. 34.

Bas.: *Pleurothallis chaetoglossa* Luer, Selbyana 3: 262, 1977.

Ety.: From the Greek *chaetoglossa*, "a long-haired tongue," referring to the pilose lip.

Plant small, epiphytic, more or less caespitose with long, prolific, pendent branches, up to 20 cm long; roots slender at the base or from the base of a superposed ramicaul. Ramicauls descending, or pendent, slender, producing other ramicauls from the apex, 1-3 cm long, the lowermost 5-8 cm long, enclosed by 2-4 minutely scabrous, lepanthiform sheaths with slightly dilated ostia. **Leaf** erect in relation to the ramicaul, thickly coriaceous, elliptical, acute, 18-20 mm long, 4-5 mm wide, contracted below into a petiole 1-2 mm long. **Inflorescence** a loose, successively 2- to 3-flowered raceme, ca. 1 cm long, borne by a filiform peduncle 3-5 mm long, from near the apex of the ramicaul; floral bract 1-1.5 mm long; pedicel 1.5-2 mm long; ovary 0.5 mm long; **sepals** translucent pale yellow or white, glabrous, subcarinate, the dorsal sepal ovate, narrowly obtuse, 5.5 mm long, 2 mm wide, 3-veined, the lateral sepals triangular, oblique, acute, 5 mm long, 1.5 mm wide, 1-veined, connate basally to form a shallow mentum below the column-foot; **petals** translucent yellow, elliptical, acute, entire, 4 mm long, 1.5 mm wide, 1-veined; **lip** yellow, obscurely ovate-trilobed, 2.5 mm long, 1.5 mm wide across the lateral lobes, narrowed and terete above the middle, narrowly obtuse, densely long-pilose, the lateral lobes below the middle, erect, broadly obtuse, shortly pubescent, the disc shallowly concave, the base with a curved, transverse callus, hinged to the column-foot; **column** terete, 1.25 mm long, the anther subapical, the stigma ventral, the column-foot short.

ECUADOR: Prov. of Pastaza: epiphytic in citrus grove north of Puyo, alt. 750 m, 21 Mar. 1976, *C. Luer, J. Luer & J. Brenner 1097* (Holotype: SEL; Isotype: MO). Prov. of Morona-Santiago: Cordillera del Cutucú, between Mendez and Morona, alt. 1000 m, 5 Feb. 1987, *C. Luer J. Luer & A. Hirtz 12665* (MO); same area, alt. 950 m, 17 Jan. 1989, *C. Luer, J. Luer, P. Jesup, A. Jesup, A. Hirtz & S. Ortega 13973* (MO). Prov. of Zamora-Chinchipe: Cordillera del Condor, east of Paquisha, alt. 1200 m, 23 Jan. 1992, *C. Luer, J. Luer, P. Jesup, A. Jesup & A. Hirtz 16131* (MO); in trees along Río Jamboe south of Zamora, alt. 1550 m, 22 Jan. 1992, *C. Luer, J. Luer, P. Jesup, A. Jesup & A. Hirtz 16096* (MO).

This uncommon pendent species is found at altitudes around 1000 meters above sea level in eastern Ecuador. Long, leafy branches composed of superposed ramicauls trail among loose moss on trees. The small, pale yellow flowers are produced in short racemes shorter than the leaves. Most remarkable is the narrow, thickened anterior lobe of the three-lobed lip that is densely long-pubescent.

Trichosalpinx chamaelepanthes (Rchb.f.) Luer, Phytologia 54: 395, 1983. Fig. 35., 36.

Bas.: *Pleurothallis chamaelepanthes* Rchb.f., Bonplandia 3: 240, 1855.
Ety.: From the Greek *chamae-* and *Lepanthes*, "a creeping *Lepanthes*," in allusion to the habit.

Syn.: *Humboldtia chamaelepanthes* (Rchb.f.) Kuntze, Rev. Gen. Pl. 2: 667, 1891.

Syn.: *Lepanthes corazonis* Schltr., Repert. Spec. Nov. Regni Veg. 14: 125, 1915.
Ety.: Named for Mt. Corazón where the species was collected.

Syn.: *Pleurothallis microcharis* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 8: 61, 1921.
Ety.: From the Greek *microcharis*, "a little beauty," referring to the pretty habit and flowers.

Plant small, epiphytic, more or less caespitose with long, prolific, creeping to pendent branches, up to 30 cm long; roots slender at the base or from the base of a superposed ramicaul. Ramicauls erect, ascending, or pendent, slender, producing other ramicauls from the apex, 1-8 cm long, the lowermost the longest, enclosed by 2-8 usually long-ciliate, lepanthiform sheaths with dilated ostia. **Leaf** erect in relation to the ramicaul, thickly coriaceous, broadly elliptical to suborbicular, obtuse, 3-12 mm long, 4-10 mm wide, contracted below into a petiole 0.5-1 mm long. **Inflorescence** a solitary flower or a loose, successively 2- to 3-flowered raceme, 10-25 mm long, rarely 3 flowers open simultaneously, borne by a filiform peduncle 7-15 mm long, from near the apex of the ramicaul; floral bract 1.5 mm long; pedicel 1-1.25 mm long; ovary minutely echinate, 0.5-0.8 mm long; **sepals** translucent purple or yellow, ciliate-denticulate, carinate-spiculate, ovate, acute, acuminate, variously caudate, the dorsal sepal 7-18 mm long including the tail, 2-4 mm wide, 3-veined, the lateral sepals oblique, 7-18 mm long including the tails, connate in the lower third, 2-4 mm wide together, each 1-veined; **petals** translucent purple or yellow as the sepals, ovate, elliptical, acute to obtuse, entire to microscopically erose, 2.75-4 mm long, 1-2 mm wide, 1-veined; **lip** colored as the sepals, ovate-trilobed, 3-4.5 mm long, 1.25-2 mm wide, the anterior lobe ovate, obtuse, minutely to microscopically denticulate-erose, the lateral lobes basal in the lower quarter, erect, broadly rounded to obtuse and oblique, the disc shallowly concave between a pair of low calli along the middle third from the basal lobes, the base narrowly subtruncate, hinged to the column-foot; **column** terete, 2-3 mm long, the anther subapical, the stigma ventral, the column-foot short.

ECUADOR: Prov. of Pichincha: valley of Lloa on trees, 1847, *W. Jamesom 313* (Holotype: W; Isotypes: BR, G, K); subandean forests of Mt. Corazón, July 1875, *A. Sodiro 26* (holotype of *L. corazonis* presumably destroyed at B, lectotype here designated: QPLS); in forests on west slope of Volcán Corazón, *A. Sodiro s.n.* (holotype of *P. microcharis* presumably destroyed at B, lectotype: QPLS); epiphytic in cloud forest above Tandapi, alt. 2100 m, 31 Mar. 1984, *C. Luer, A. Hirtz, S. Dalström, T. Höijer & J. Kuijt 9820* (MO); side road below Tandapi, alt. 1600 m, 1 Mar. 1986, *C. Luer, C. Dodson, A. Hirtz & A. Embree 12064* (MO); west flank of Volcán Illiniza, Cerro Azul, alt. 2800 m, 23 Jan. 1987, *C. Luer, J. Luer & A. Hirtz 12480* (MO). Prov. of Azuay: scrub vegetation along new road west of Zorrogucho, alt. 2950 m, 16 Mar. 1984, *C. Luer, S. Dalström, T. Höijer & J. Kuijt 9514* (MO); El Chorro above Molleturo, 7 Mar. 1985, *G. Harling & L. Anderssen 22871, 22905* (AMES, GB). Prov. of Bolívar: scrub vegetation west of Guaranda toward Catarama, alt. 2500 m, 13 Mar. 1991, *C. Luer, J. Luer, A. Hirtz et al. 15037* (MO); forest at pass north of Chillanes, alt. 2650 m, 23 Mar. 1984, north of Guaranda toward Fecundo Vela, alt. 2800 m, 24 Mar. 1984, *C. Luer, S. Dalström, T. Höijer, J. Kuijt & A. Hirtz 9728* (MO); west of Salinas toward La Palma, alt. 3400 m, 10 Mar. 1991, *C. Luer, J. Luer, A. Hirtz et al. 14944* (MO). Prov. of Carchi: Nudo de Boliche, Voladero, alt. 3800 m, 12 June 1939, *C. W. Penland & R. H. Summers 907* (AMES); El Mirador between San Juan Andrade and Playón de San Francisco, 22 Mar. 1991, alt. 3300 m, *A. Hirtz, X. Hirtz, J. Del Hierro & S. Ortega 5295* (MO); east of Tulcán toward El Carmelo, alt. 3200 m, 6 Apr. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 11116* (MO); southwest of Tulcán toward El Angel, 5 Apr. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 11062* (MO). Prov. of Chimborazo: La Palma, alt. ca. 3400 m, 15 July 1983, *A. Hirtz 1251* (MO); above Pallatanga, alt. 2900 m, 19 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10653* (MO). Prov. of Cotopaxi: Tenefuerste, Río Pilalo, alt. 750-1300 m, 21 Feb. 1982, *C. H. Dodson & A. H. Gentry 12775* (MO); near Pilalo, alt. 2450 m, 26 Feb. 1986, *C. Luer, J. Luer & A. Embree 12045* (MO). Prov. of El Oro: above Zaruma, alt. 1800 m, 1 Feb. 1987, *C. Luer, J. Luer & A. Hirtz 12562* (MO); north of Salvias, alt. 2000 m, 4 Feb. 1993, *S. Dalström, T. Höijer & H. Wanntorp 1834* (MO); between Pacha and Pasaje, alt. 2100 m, 3 Feb. 1993, *S. Dalström, T. Höijer & H. Wanntorp 1821* (MO). Prov. of Imbabura: Los Cedros Reserve, alt. 2100 m, 20 Jan. 1993, *S. Dalström, T. Höijer & H. Wanntorp 1772, 1773* (MO). Prov. of Loja: pass north of Loja, alt. 3150 m, 17 Mar. 1984, *C. Luer, S. Dalström, T. Höijer & J. Kuijt 9549* (MO); above San Pedro de Vilcabamba, alt. 2400 m, 23 Apr. 1986, *D. D'Alessandro 644* (MO). Prov. of Napo: above Papallacta, alt. 2600 m, May 1984, *A. Hirtz 1770* (MO); between Papallacta and Baeza, alt. 2850 m, 14 Apr. 1984, *C. H. Dodson, A. Hirtz, W. & M. Thurston 14254* (MO). Prov. of Pastaza: along Río Zuñag, alt. 2400 m, 28 Feb. 1990, *A. Hirtz, S. Dalström et al. 4634* (MO). Prov. of Zamora-Chinchipe: east of the pass east of Loja, alt. 2785 m, 19 May 1971, *B. MacBryde 306* (AMES); same area, alt. 2750 m, 21 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10696* (MO); south of the pass south of Jimbura, alt.

3050 m, 21 Feb. 1986, *C. Luer, J. Luer, A. Hirtz, W. Flores & A. Embree 12010* (MO). "Alto de Tabano," *E. André s.n.* (K).
COLOMBIA: Dept. of Antioquia: Guatapé, Santa Rita, Finca Montepinar, alt. 1850 m, 31 Mar. 1983, *Linda Albert de Escobar & J. P. Folsom 3393* (MO and U of Ant); Altos de Barbacoa, near TV tower, alt. 3150 m, 15 Sept. 1984, *C. H. Dodson, R. Escobar & E. Valencia 15295* (MO); forest remnant east of Santo Domingo, alt. 2170 m, 12 May 1985, *C. Luer, R. Escobar & E. Valencia 11352* (MO); between Salgar and El Dauro (Chocó), alt. 2320 m, 30 Sept. 1987, *J. L. Zarucchi, A. Brant & J. Betancur 6056* (MO); Carmen de Viboral, alt. 2000 m, flowered in cultivation at Colomborquídeas, 10 Apr. 1988, *C. Luer 13137* (MO). Dept. of Caldas: Cerro Tatama, alt. 2800-3300 m, 8 Sept. 1922, *F. W. Pennell 10448* (AMES, NY). Dept. of Cauca: Alto del Duende, páramo, alt. 3300 m, 1 Dec. 1944, *J. Cuatrecasas 18821* (AMES, COL; Páramo de Puracé, alt. 3300 m, 27 July 1953, *M. Schneider 193b* (S). Dept. of Cundinamarca: Páramo de Guasca, alt. 3300-3500 m, 24 Mar. 1949, *M. Schneider 193a* (S). Dept. of Huila: La Plata, alt. 2900 m, 29 Mar. 1939, *K. von Sneidern 2029* (S). Dept. of Nariño: "Azufel," near Tuquerres, 18 May 1876, *E. André 3226* (K). Dept. of Putumayo: Valle del Sibundoy, alt. 2650 m, 18 Apr. 1963, *M. L. Bristol 826* (AMES). Dept. of Santander: above La Baja, trail to Vetas, alt. 2900 m, 19 May 1982, *C. Luer, R. Escobar & D. Portillo 7889* (SEL); east of Bucaramanga toward Berlin, alt. 3000 m, 7 May 1984, *C. Luer, J. Luer, R. Escobar & E. Valencia 10190* (MO). Dept. of Valle del Cauca: Páramo Los Farallones, alt. 3500-3600 m, 12 Oct. 1944, *J. Cuatrecasas 17982* (AMES); Finca Zingara, between Cali and Buenaventura, alt. 1900 m, 24 Sept. 1994, *J. Giraldo-Gensini & L. Olver A. 453* (MO, TULV).
PERU: Dept. of Cuzco: Quispicanchi, between Abra Walla Walla and Marcapata, alt. 2800-4600 m, 21-25 Apr. 1988, *P. Nuñez, F. Loaysa & W. Loaysa 9027* (MO). Dept. of Pasco: Oxapampa, trail to summit of Cordillera Yanachaga via Río San Daniel, alt. 2600 m, 18 July 1984, *D. N. Smith, A. & H. Böttger 7878* (MO).

This species is the most common of the genus in the Andes, but no counterpart is known from Central America. It was identified in Selbyana 3: 346, 1977, by the synonym *T. microcharis*. *Trichosalpinx chamaelepanthes* is recognized by dishveled clumps of branching ramicauls, each segment bearing a small, rounded leaf; long, prolific chains are produced in shady habitats (Fig. 36.). Often floriferous, the plants may be covered by numerous bright purple flowers that are produced in short racemes. As in all widely distributed, small species of pleurothallids, much variation occurs. The flowers are most often some shade of purple, but pure yellow color-forms are not infrequent.

The sepals are variously echinate on the ribs and margins. The apices are acute to acuminate into tails of various lengths. The petals are either acute or broadly obtuse. The lip is trilobed with the margins minutely to microscopically erose. Small, obtuse lobes are erect on the basal fourth. The disc is shallowly concave centrally. It is the only species of *Trichosalpinx* with papillose ovaries, as noted by Schlechter in his description of *Lepanthes corazonis*.

Trichosalpinx costata (Luer & Vásquez) Luer, Phytologia 54: 395, 1983. Fig. 37.
Bas.: *Pleurothallis costata* Luer, Phytologia 46: 364, 1980.
Ety.: From the Latin *costatus*, "ribbed," referring to the non-ciliate sheaths of the ramicauls.

Plant small to medium in size, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 5-11 cm long, enclosed by 5-8 closely appressed, glabrous, lepanthiform sheaths with dilated ostia. **Leaf** suberect, coriaceous, narrowly ovate, acute, 3-5 cm long, 0.7-0.9 cm wide, narrowly cuneate below into a petiole 3-4 mm long. **Inflorescence** a loose, lightly flexuous, simultaneously few-flowered raceme, 3-4 cm long, including the peduncle 1-1.5 cm long, from near the apex of the ramicaul; floral bracts 2.5-3 mm long; pedicels 2-3 mm long; ovary 6-costate, 1.5 mm long; **sepals** yellow, veined in red, glabrous, carinate, the dorsal sepal ovate, acute, acuminate, 7.5 mm long, 3 mm wide, 3-veined, the lateral sepals triangular, acute, 8 mm long, 2 mm wide, each 2-veined, connate 2.5 mm; **petals** yellow with red midvein, elliptical, acute, 4 mm long, 1.2 mm wide, 1-veined; **lip** heavily suffused with red-purple, oblong-trilobed, 4 mm long, 1.9 mm wide, the apical 2 thirds oblong-ovate, obtuse to rounded, with the lateral lobes erect, uncinate, above the base, the disc shallowly sulcate between a pair of low calli from the bases of the lobes extending to about the middle, the base truncate, hinged to the column-foot; **column** terete, 2 mm long, the anther subapical, the stigma ventral, the foot thick.

BOLIVIA: Dept. of La Paz: Nor Yungas, epiphytic in moist forest southeast of Coroico, alt. 2000 m, 3 Feb. 1980, *C. Luer, J. Luer, R. Vásquez & R. Lara 5793* (Holotype: SEL).

This species is uncommon in the Yungas of Bolivia. It is related to *T. dirhamphis* which is frequent and widely distributed in the Andes from Ecuador into Bolivia. *Trichosalpinx costata* is distinguished from the latter by the glabrous, lepanthiform sheaths ramicauls and few-flowered racemes of smaller flowers shorter than the leaf. The lip has similar uncinate basal lobes.

Trichosalpinx crucilabia (Ames & Correll) Luer, Phytologia 54: 395, 1983. Fig. 38.
Bas.: *Pleurothallis crucilabia* Ames & Correll, Bot. Mus. Leafl. 10: 76, 1942.
Ety.: From the Latin *crucilabius*, "with a cross-shaped labellum," referring to the lip.

Plant small, epiphytic, caespitose; roots slender. Ramicauls ascending to erect, slender, 2-4 cm long, enclosed by 3-5 closely appressed, minutely ciliate, lepanthiform sheaths with oblique ostia. **Leaf** suberect, coriaceous, narrowly ovate, acute, 15-25 mm long including a petiole 2-3 mm long, 5-6 mm wide, narrowly cuneate below into the petiole. **Inflorescence** a loose, nearly simultaneously few-flowered raceme, 3-4 cm long, including the peduncle 1-1.2 cm long, from near the apex of the ramicaul; floral bracts 1.5 mm long; pedicels 2 mm long; ovary 1.5 mm long; **sepals** pale yellow, glabrous, fleshy, subcarinate, the dorsal sepal ovate, subacute, concave, 4 mm long, 2 mm wide, 3-veined, connate basally to the lateral sepals, the lateral sepals oblong, acute, 4 mm long, 1 mm wide, each 1-veined, connate at the base; **petals** translucent yellow, oblong, round at the apex, 1.5 mm long, 0.8 mm wide, 1-veined; **lip** light yellow, oblong-trilobed, 3 mm long, 1 mm wide, 2 mm wide across the lobes, the apical 2 thirds oblong, round at the apex, the lateral lobes erect, below the middle, broadly rounded, with low intramural calli, the disc shallowly sulcate centrally above the base, the base narrowed, truncate, hinged to the column-foot; **column** terete, 2 mm long, the anther subapical, the stigma ventral, the foot 1 mm long.

GUATEMALA: Dept. of Guatemala: Volcán Pacaya, above Las Calderas, alt. 1800-2400 m, 30 Nov. 1938, *P. C. Standley 58433* (Holotype: F), C. Luer illustr. 17825.

This species is known only from the two plants mounted on the type-sheet at Field. It is related to the widely distributed *T. cedralensis*, but differs with nonproliferic ramicauls and petals rounded at the apex. The lips are very similar, but the lateral lobes are distinctly callous in *T. crucilabia*, not mentioned in the original description. It is also similar to the Andean *T. multicuspidata*, also with nonproliferating ramicauls, but differs with noncaudate sepals; petals rounded at the apex; and thickened, lateral lobes of the lip.

Trichosalpinx dalstroemii Luer, sp. nov. Fig. 39.
Ety.: Named in honor of Stig Dalström formerly of Falun, Sweden, co-discoverer of this species.

Planta mediocris caespitosa, ramicaulibus horozontalibus, racemo pendenti laxe successivi-pluriflore folio elliptico multilongiore, sepalis glabris acutis lateralibus supra medium connatis, petalis ellipticis obtusis et labello obovato cum angulis supra basim obtusis.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls more or less horizontal, slender, 4-9 cm long, enclosed by 7-8 dark, closely appressed, lepanthiform sheaths with ciliate ostia. **Leaf** erect in relation to the ramicaul, thickly coriaceous, suffused with purple beneath, elliptical, acute, 2-3.5 cm long, 5-7 cm wide, cuneate below into a petiole 1-2 mm long. **Inflorescence** an arcuate to more or less pendent, loosely several-flowered raceme up to 17 cm long including the peduncle 4-7 cm long, with the flowers borne singly, from near the apex of a ramicaul; floral bract 3 mm long; pedicel 1.5 mm long; ovary 2 mm long; **sepals** yellow, sometimes with the veins suffused with purple, glabrous, subcarinate, the dorsal sepal ovate, acute, concave, 14-16 mm long, 4.5 mm wide expanded, 3-veined, connate to the lateral sepals for 1 mm, the lateral sepals connate 9 mm into a subelliptical, bifid lamina with acute apices, 17-14 mm long, 5 mm wide, 2-veined; **petals** yellow with purple midvein, obovate, obtuse, subunguiculate, 6-7 mm long, 3 mm wide, 1-veined; **lip** yellow, oblong-obovate, 5.5 mm long, 1.25 mm wide, the apex rounded, the margins with obtuse angles above the base, the disc shallowly concave, featureless, the base truncate, hinged to the column-foot; **column** terete, 3 mm long, the anther subapical, the stigma ventral.

ECUADOR: Prov. of Bolívar: epiphytic in patch of forest at the pass north of Chillanes, alt. 2800 m, 11 Feb. 1990, *S. Dalström & L. Årnby 1315* (Holotype: MO), C. Luer illustr. 16208; forest north of Guaranda toward Facundo Velo, alt. 2800 m, 24 Mar. 1984, *C. Luer, A. Hirtz, S. Dalström, T. Höijer & J. Kuijt 9686* (MO); between Salinas and La Palma, alt. 3400 m, 10 March 1991, *C. Luer, J. Luer, A. Hirtz et al. 14952* (MO). Prov. of Imbabura: Selva Alegre, alt. 2850 m, 6 Apr. 1984, *C. Luer, S. Dalström & T. Höijer 9976* (MO).

This species from the western declivities of the Ecuadorian Andes is characterized by a more or less horizontal, caespitose habit and long, loose, successively flowered, drooping racemes. The comparatively large flower near the tip of the raceme is resupinate through the position of the rachis with the apices of the lateral sepals curving downward.

Trichosalpinx dirhamphis (Luer) Luer, Phytologia 54: 395, 1983. Fig. 40.

Bas.: *Pleurothallis dirhamphis* Luer, Selbyana 3: 292, 1977.

Ety.: From the Greek *dirhamphis*, "with two hooks," referring to the basal lobes of the lip.

Syn.: *Pleurothallis aequatorialis* Luer, Selbyana 5: 158, 1979.

Ety.: Named for the country of its origin.

Syn.: *Trichosalpinx aequatorialis* (Luer) Luer, Phytologia 54: 394, 1983.

Plant medium to large in size, epiphytic, caespitose; roots slender. Ramicauls erect, slender, often prolific, 3-15 cm long, enclosed by 2-9 dark, closely appressed, lepanthiform sheaths with ciliate ostia. **Leaf** erect, coriaceous, elliptical to narrowly elliptical, acute, 2-6 cm long, 0.5-1.5 cm wide, cuneate below into a petiole 4-5 mm long. **Inflorescence** a loose, lightly flexuous, flexible, simultaneously several- to many-flowered raceme, up to 20 cm long, including the filiform peduncle 3-5 cm long, from near the apex of the ramicaul; floral bracts 2-3 mm long; pedicels 2-4 mm long; ovary 1-2 mm long; **sepals** yellow, often striped in red or brown, glabrous, carinate, the dorsal sepal ovate, acute, long-acuminate, 8-15 mm long, 3-5 mm wide, 3-veined, the lateral sepals spreading, free or connate 1-2 mm, narrowly ovate-triangular, acute, attenuate, 8-15 mm long, 1.5-2 mm wide, each 1-veined, (occasionally faintly 2-veined); **petals** translucent, elliptical-obovate, 2.75-4.5 mm long, 1-2.5 mm wide, 1-veined, the apex obtuse to subtruncate with minutely erose margins, occasionally subacute; **lip** brown, oblong-trilobed, arcuate, 4-5 mm long, 2-2.75 mm wide, the apical 2 thirds oblong-ovate, obtuse, with the margins recurved, the basal lobes erect, uncinate, the disc with a pair of low, thick calli from the bases of the lobes extending to about the middle, the base truncate, hinged to the column-foot; **column** terete, 1.5-2 mm long, the anther subapical, the stigma ventral, the foot thick, 1 mm long.

ECUADOR: Prov. of Napo: north of Archidona, alt. 1500 m, Aug. 1975, *C. Luer, G. Luer & S. Wilhelm 661* (Holotype: SEL). Prov. of Azuay: old road between Guayaquil and Cuenca, alt. 2500 m, 1 Mar. 1977, *C. Luer, J. Luer & K. Córdoba 1479* (SEL). Prov. of Bolívar: west of Guaranda toward Balzapamba, alt. 2000 m, 26 Mar. 1984, *C. Luer, A. Hirtz, S. Dalström, T. Höijer & J. Kuijt 9732A* (MO); same area, alt. 2500 m, 12 Feb. 1990, *S. Dalström & L. Årmby 1326* (MO); west of Guaranda toward Catarama, alt. 2500 m, 13 Mar. 1991, *C. Luer, A. Hirtz et al. 15036* (MO); west of Salinas, alt. 2800 m, 10 Mar. 1991, *C. Luer, A. Hirtz et al. 14958* (MO); south of San Miquel, alt. 2300 m, 25 Mar. 1984, *C. Luer, A. Hirtz, S. Dalström, T. Höijer & J. Kuijt 9701* (MO); near the pass north of Chillanes, alt. 2500 m, 17 Feb. 1991, *C. H. Dodson, F L Stevenson, N. Williams, M. Whitten & A. Embree 18706* (MO); same area, alt. 2650 m, 11 Mar. 1991, *C. Luer, A. Hirtz et al. 14988* (MO). Prov. of El Oro: above Zaruma, alt. 1800 m, 1 Feb. 1987, *C. Luer, J. Luer & A. Hirtz 12561* (MO); north of Salvias, alt. 2100 m, 4 Feb. 1993, *S. Dalström, T. Höijer & H. Wanntorp 1839* (MO). Prov. of Loja: south of Yangana, alt. 2250 m, 11 May 1981, *C. Luer, J. Luer et al. 6151* (SEL); Nudo de Sabanilla, alt. 2600 m, 6 Feb. 1985, *G. Harling & L. Andersson 21708* (GB); NE of Tambillo, NE of Zaruma, alt. 2600-2750 m, 21 Feb. 1988, *U. Molau & B. Eriksen 3141* (AAU, GB). Prov. of Morona-Santiago: east of the pass between Gualaceo and Limón, alt. 2750 m, 16 Feb. 1986, *C. Luer, J. Luer, A. Hirtz, W. Flores & A. Embree 11824* (MO); southeast of Sigsig, alt. 2400 m, 13 Jan. 1989, *C. Luer, J. Luer, P. Jesup, A. Jesup, A. Hirtz & S. Ortega 13868* (MO). Prov. of Pichincha: near Tandayapa west of Nono, alt. 2200 m, 26 Jan. 1974, *G. Harling & L. Andersson 11634* (GB); between Quito and Santo Domingo, alt. 1500 m, 17 Aug. 1976, *C. H. Dodson 5959* (SEL); same area, along new road, alt. 1950 m, 31 Mar. 1984, *C. Luer, A. Hirtz, S. Dalström, T. Höijer & J. Kuijt 9832* (MO); same area, alt. 1800-2200 m, 16 Feb. 1986, *V. Zak 842* (AMES, MO); old road between Quito and Santo Domingo, alt. 1950-2000 m, 9 Feb. 1988, *U. Molau, B. Eriksen & M. Fredrikson 3012* (AAU, GB); Narangalito, alt. 1000 m, Feb. 1995, *A. Hirtz 6194* (MO). Prov. of Zamora-Chinchipe: above Valladolid, alt. 2000 m, 18 Mar. 1984, *C. Luer, S. Dalström, T. Höijer & J. Kuijt 9621* (MO). Without locality, collected by W. Teague, flowered in cultivation in San Francisco, CA, 20 Aug. 1979, *C. Luer 4121* (holotype of *P. aequatorialis*: SEL).

PERU: not yet identified from Peru.
BOLIVIA: Dept. of La Paz: between Inquisivi and Circuata, alt. 2550 m, 28 Jan. 1981, *C. Luer, J. Luer & R. Vásquez 5793* (SEL).

This species is common and widely distributed in southern Ecuador. A single collection from Bolivia indicates that it certainly exists also in intervening Peru. It is closely related to the successively flowered *T. montana* from southern Brazil. *Trichosalpinx dirhamphis* is distinguished by the frequently prolific habit of the ramicauls, narrowly elliptical leaves that are far exceeded by a showy, lax, simultaneously flowered raceme with bright yellow flowers that are frequently striped in red, and a large, brown lip. The sepals are long-acuminate with the laterals free and diverging. The petals are obtuse with the apical margin more or less irregular. The lip is distinctive with a pair of erect, uncinate basal lobes. The size and shape of the basal lobes is variable. Sometimes they are half the dimensions as the largest. A collection with exceptionally long and narrow basal lobes was described as *P. aequatorialis*.

Trichosalpinx dressleri Luer, sp. nov. Fig. 41.

Ety.: Named in honor of Robert L. Dressler, formerly of the Smithsonian Tropical Research Institute, Panama, who discovered this species.

Planta parva caespitosa, foliis anguste ellipticis ramicaulibus aequilongis cum inflorescentia multilongiore, sepalis acutis caudatis lateralibus profunde connatis, petalis ellipticis, labello oblongo obtuso infra medium bicalloso supra basim alte lobulato.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 10-22 mm long, enclosed by 3-4 closely appressed, microscopically scabrous, lepanthiform sheaths. **Leaf** erect, coriaceous, narrowly elliptical, acute, 15-25 mm long, 5-7 mm wide, cuneate below into a petiole 1-1.5 mm long. **Inflorescence** a loose, strict, secund, successively several-flowered raceme up to 7 cm long including the slender peduncle 4 cm long, 2 flowers often borne simultaneously, from near the apex of a ramicaul; floral bracts 2 mm long; pedicels 1.5-2 mm long; ovary 1.5 mm long; **sepals** yellow, glabrous, carinate, the dorsal sepal with 3 maroon veins, ovate-triangular, acute, acuminate above the middle into a slender, tail-like apex, 11 mm long, 3 mm wide, 3-veined, connate to the lateral sepals for 0.5 mm, the lateral sepals connate 4.5 mm into a bifid, ovate, lamina 4 mm wide, 10 mm long including 4-5 mm long tails from the acute, approximate apices, each 2-veined; **petals** elliptical, obtuse, 3 mm long, 1.8 mm wide, suffused with purple along the vein; **lip** yellow, oblong-trilobed, 4 mm long, 2 mm wide, the blade oblong, obtuse, the lateral lobes basal, erect, narrowly obtuse, finger-like, the disc with a low pair of rounded calli below the middle,the base truncate, hinged to the column-foot; **column** terete, 1.5 mm long, minutely denticulate at the apex, the anther subapical, the stigma ventral.

PANAMA: Prov. of Panama: epiphytic in forest on Cerro Jefe, alt. ca. 1000 m, 2 Dec. 1979, *R. L. Dressler 5855* (Holotype: MO); C. Luer illustr. 16215.

This little species is unique in Central America, its closest relatives being the Andean *T. dirhamphis* and the Brazilian *T. montana*. *Trichosalpinx dressleri* is known from a single collection by Dressler from eastern Panama. It is distinguished by the caespitose habit, narrowly elliptical leaves, and a much longer, successively flowered raceme. The flowers are comparatively large with caudate sepals. The laterals are connate to the base of the tails as in *T. montana*. The petals are obtuse. Most distinct is the oblong lip with a pair of erect, finger-like, basal lobes. The successively flowered inflorescence and the deeply connate lateral sepals seem to indicate a closer affinity to the Brazilian relative.

Trichosalpinx drosoides Carnevali & Ramírez, Ernstia 42: 1, 1987. Fig. 42.

Ety.: From the Greek *drosoides*, "like dew," perhaps referring to the habitat.

Plant small, epiphytic, scandent or pendent, up to about 8 cm long; roots slender. Ramicauls more or less prostrate, prolific, branching, slender, 3-9 mm long, enclosed by 2-3 closely appressed, minutely ciliate, lepanthiform sheaths. **Leaf** prostrate to pendent, thickly coriaceous, broadly elliptical to suborbicular, obtuse to rounded, the blade 7-9 mm long, 2-2.5 mm thick, 5-7 mm wide, rounded below, contracted into a petiole less than 1 mm long. **Inflorescence** a loose, successively 2-flowered raceme ca. 10 mm long including the slender peduncle 5 mm long, 5 mm between the 2 flowers, from near the apex of a ramicaul; floral bracts 1.5 mm long; pedicels 1.5 mm long; ovary 0.8 mm long; **sepals** pale yellow, glabrous, subcarinate, the dorsal sepal ovate-triangular, acute, 6 mm long, 1.5 mm wide, 3-veined, essentially free from the lateral sepals, the lateral sepals narrowly triangular, acute, 5 mm long, 1 mm wide, 1-veined, connate 1 mm; **petals** membranous, subfalcate, 4.5 mm long, 1 mm wide, 1-veined, narrowed above the middle into an acute apex; **lip** yellow, oblong-ovate, arcuate, 2.5 mm long, 0.75 mm wide, with the apical third obtuse with the margin erose, the margins of the basal two-thirds erect, broadly rounded, the base truncate, hinged to the column-foot; **column** terete, slender, winged above the middle, 2 mm long, the anther apical, the stigma ventral.

VENEZUELA: Edo. Zulia: Sierra de Perijá, southeast of Pishikakao, alt. 1500-1800 m, 27 Mar. 1982, *J. A. Steyermark & G. C. K. & E. Dunsterville 109882* (Holotype: VEN); presumably same locality, *J. A. Steyermark, G. C. K. & E. Dunsterville 105678* (VEN); presumably same locality, flowered in cultivation, May 1973 and Apr. 1974, by *G. C. K. Dunsterville 1278* (AMES), C. Luer illustr. 17185.

This little, creeping species is apparently endemic in the Sierra de Perijá in northwestern Venezuela. Vegetatively, it is scandent with short, prolific ramicauls growing within moss. The thick leaves are nearly round, creating the shape of a lens. The Inflorescence is a distantly two-flowered raceme a little longer than the leaf. The sepals are acute; the petals are subfalcate, tapered above the middle to the acute apex; and the apex of the arcuate lip is obtuse and erose, while the sides below the apical third are broadly rounded and erect. The above description and illustration were made from plants with flowers pickled by Dunsterville.

Trichosalpinx dunstervillei Luer, sp. nov. Fig. 43.

Ety.: Named in honor of G.C.K. (Stalky) Dunsterville, noted author and illustrator of the orchids of Venezuela, who first illustrated this species.

Species haec *T. vaganti* (Garay & Dunst.) Luer similis, sed floribus majoribus cum mento grandi, labello arcuato tricalloso cum lobis basalibus differt.

Plant small to medium in size, epiphytic, prolific, branching, erect to suberect, up to 15 cm or more tall; roots slender at the base. Ramicauls ascending, slender, producing another ramical from the apex, 1-2 cm long above, up to 6 cm long below, enclosed by 2-4 lepanthiform sheaths with minutely scabrous ostia. **Leaf** erect, thickly coriaceous, semiterete, narrowly elliptical, acute, 2-4 cm long, 2.5-3 mm wide, 2-2.5 mm thick, contracted below into a petiole 1-2 mm long. **Inflorescence** a loose, simultaneously few-flowered raceme 4-5 cm long including the filiform peduncle 1-1.5 cm long, from near the apex of a ramicaul; floral bracts 1.5-2 mm long; pedicels 2-4 mm long; ovary 0.8 mm long; **sepals** yellow, glabrous, subcarinate, the dorsal sepal narrowly ovate, concave, acute, long-attenuate, 12-14 mm long, 2 mm wide, 3-veined, barely connate to the lateral sepals, the lateral sepals narrowly linear-triangular, oblique, acute, 12-13 mm long, 1 mm wide, 1-veined; **petals** translucent, elliptical, subacute, 2.3 long, 0.8 mm wide, 1-veined; **lip** yellow, elliptical-trilobed, arcuate, 3.2 mm long, 1.4 mm wide, the apex broadly rounded, the lateral lobes small, above the base, erect, oblique, obtuse, antrorse, the disc with a pair of tall carinae in the middle third from the lateral lobes, the sides deflexed from the basal lobes, with a thickened midvein down the center for two thirds the length, the base truncate, hinged to the column-foot; **column** terete, 1.5 mm long, with small, obtuse, apical wings, the foot 1 mm long, the anther apical, the stigma ventral.

VENEZUELA: Edo. Trujillo: epiphytic in cloud forest between Boconó and Guaramacal, alt. 2350 m, Jan. 1970, collector unknown, illustrated by *G. C. K. Dunsterville 1127* (Holotype: AMES), C. Luer illustr. 17187.

Trichosalpinx dunstervillei is known only from the type-collection from the Sierra Nevada de Venezuela. The accompanying description and illustration were made from alcoholized material at AMES. Dunsterville's illustration (*Dunsterville 1127*) was used to illustrate *T. vagans*.

Trichosalpinx dunstervillei differs from the Colombian *T. vagans* by the larger flowers, an acute mentum not seen in Dunsterville's illustration, and a larger, arcuate lip. The lateral lobes are above the base with the sides of the lip deflexed from them. Instead of a tall, central carina, the midvein is thickened into a low carina between the pair of tall, parallel carinae.

Trichosalpinx dura (Lindl.) Luer, Phytologia 54: 395, 1983. Fig. 44., 45.

Bas.: *Pleurothallis dura* Lindl., Folia Orch. Pleuroth. 32, 1859.
Ety.: From the Latin *durus*, "hard," referring to the consistence of the leaves.

Syn.: *Pleurothallis foliata* Griseb., Fl. Brit. W. Ind. 610, 1864.
Ety.: From the Latin *foliatus*, "with leaves," referring to the leafy "stems."

Syn.: *Humboldtia dura* (Lindl.) Kuntze, Rev. Gen. Pl. 2: 667, 1891.

Syn.: *Humboldtia foliata* (Griseb.) Kuntze, Rev. Gen. Pl. 2: 667, 1891.

Syn.: *Pleurothallis corazonica* Lehm. & Kraenzl., Bot. Jahrb. Syst. 26: 443, 1899.
Ety.: Named for Volcán Corazón on whose flank this species was collected.

Syn.: *Pleurothallis broadwayi* Ames, Orchid. 2: 267, 1908.
Ety.: Named in honor of W. E. Broadway who collected this species on Grenada.

Syn.: *Pleurothallis guadalupensis* Cogn., Symbol. Antill. 6: 432, 1909.
Ety.: Named for the island of Guadalupe where this species was collected.

Syn.: *Pleurothallis lepanthopsis* Schltr., Repert. Spec. Nov. Regni Veg. 14: 386, 1916.
Ety.: Named for the similarity of the plant to a species of *Lepanthes*.

Syn.: *Pleurothallis amygdalina* Rolfe ex Schltr., Repert. Spec. Nov. Regni Veg. 14: 386, 1916, *nomen nudum*.

Syn.: *Pleurothallis williamsii* Ames, Orchid. 7: 120, 1922.
Ety.: Named in honor of R. S. Williams who collected this species in Panama.

Syn.: *Pleurothallis anomala* Hoehne, Arch. Inst. Biol. (São Paulo) 2: 43, 1929.
Ety.: From the Latin *anomalus*, "anomala," suggesting an anomaly of *P. mouraei*.

Syn.: *Pleurothallis broadwayi* ssp. *anomala* (Hoehne) Garay, Arch. Bot. Rio de Janeiro 11: 53, 1951.

Syn.: *Trichosalpinx foliata* (Griseb.) Luer, Phytologia 54: 395, 1983.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect, prolific, with 1-3 (sometimes 5 or more) superposed ramicauls, each ramicaul 1-4 cm (rarely to 7 cm) long, enclosed by 3-6 ciliate, lepanthiform sheaths. **Leaf** erect, coriaceous, often suffused with purple along the 3 veins, elliptical to broadly elliptical, obtuse, 6-20 mm long, 5-9 mm wide, contracted below into a petiole 1-2 mm long. **Inflorescence** a loose to subdense, simultaneously several-flowered raceme, 2-8 cm long, including the filiform peduncle 1-3 cm long, from near the apex of the ramicaul; floral bracts 0.75-1.5 mm long; pedicels 1.5-2 mm long; ovary 0.25-0.5 mm long; **sepals** yellow or yellow-white, glabrous, carinate, the dorsal sepal ovate to triangular, concave in lower third, acute, variously acuminate, 2.5-10 mm long, 1.5-2.5 mm wide, 3-veined, the lateral sepals free, narrowly ovate, oblique, to ovate-falcate, acute, variously attenuate, 2.5-8 mm long, 1-1.5 mm wide, 1-veined; **petals** translucent yellow, elliptical, 1.5-2 mm long, 0.5-1 mm wide, 1-veined, the apex various, from acute, obtuse to rounded; **lip** yellow, often suffused with red toward the base, elliptical-oblong, 1.5-2.75 mm long, 0.6-1.25 mm wide, with the margins broadly rounded below the middle, thickened toward the apex, cellular-glandular, obtuse, the disc with a pair of low, longitudinal calli near the margins, and a thickened midvein between, the base truncate to subcordate, hinged to the column-foot; **column** terete, broadly winged above the middle, 1-1.5 mm long, the anther subapical, the stigma ventral.

ECUADOR: Prov. of Pichincha?: without locality, forests of the Andes, *W. Jameson s.n.* (Holotype: K, Isotypes: AMES, W); Pichincha: Valley of Lloa on trunks and trees, *W. Jameson 313* (W); "Quito," *Karsten s.n.* (W); near Milligali, alt. 2100 m, 23 June 1876, *E. André 3623* (K); Mt. Corazón, near Milligali, *A. Sodiro 27* (holotype of *P. lepanthopsis*: BR); dense forest near Silante and Milligali, west slope of Corazón, alt. 2000-2300 m, *F. C. Lehmann 4504* (holotype of *P. corazonica* presumably destroyed at B, neotype here designated): below Chiriboga, alt. 2000 m, 1 Apr. 1984, *C. Luer, A. Hirtz et al. 9870C*

(neotype of *P. corazonica*: MO); above Tandapi, alt. 1500 m, 16 Aug. 1975, *C. Luer, G. Luer & S. Wilhelm 531* (SEL). Prov. of Azuay: west of Cuenca, around Huahuiducal, alt. 1500-1800 m, no date, *F. C. Lehmann 6913* (K). Prov. of Bolívar: Chimborazo, alt. 3000 ft., July 1860, *R. Spruce s.n.* (AMES, K, W). Prov. of Esmeraldas: between Lita and Alto Tambo, alt. 800 m, no date, *A. Hirtz 3621* (MO). Prov. of Morona-Santiago: north of Gualaquiza, alt. 1800 m, 17 Jan. 1986, *S. Dalström & T. Hõijer 1057* (MO); new road west of Macas to Guamote, alt. 1750 m, 6 Feb. 1987, *C. Luer J. Luer & A. Hirtz 12705* (MO); Río Upano north of Macas, alt. 1100 m, 15 Jan. 1989, *C. Luer, J. Luer, P. Jesup, A. Jesup, A. Hirtz & S. Ortega 13922-13923* (MO); Cordillera del Cutucú, new road to Morona, alt. 1000 m, 19 Jan. 1989, *A. Hirtz, A. Andreetta & S. Ortega 4123* (MO). Prov. of Napo: Guacamayo Range south of Baeza, alt. ca. 1000 m, 11 Aug. 1978, *C. Luer, J. Luer, A. Hirtz & A. Andreetta 3261* (SEL); north of Baeza, alt. 1000 m, 10 Aug. 1978, *C. Luer, J. Luer, A. Hirtz & A. Andreetta 3202* (SEL); Volcán Reventador, alt. 1600 m, 5 Oct. 1984, *A. Hirtz & A. Andreetta 1978* (MO); Bermejo oil fields north of Lumbaqui, alt. 850 m, 9 Feb. 1986, *C. Luer, J. Luer, A. Hirtz, W. Flores & A. Embree 11726* (MO); Río Jatunyacu above Shandia, alt. 650 m, 12 Aug. 1991, *A. Hirtz & S. Ortega 5376* (MO); between Hollin and Loreto, alt. 1200 m, Feb. 1991, flowered in cultivation at Chamblee, GA by *F L Stevenson 92-0117-5* (MO). Prov. of Pastaza: Mera, alt. 1100 m, 9 Dec. 1955, *E. Asplund 18741* (AMES, S); east of Mera, alt. 1000 m, Aug. 1975, *C. Luer, G. Luer & S. Wilhelm 923* (SEL); north of Mera, alt. 1050-1300 m, 27 Feb. 1985, *C. H. Dodson, P. M. Dodson, D. Neill & J. Zaruma 15626* (MO); between Baños and Puyo, near Mera, alt. 1050 m, 27 Feb. 1985, *C. H. Dodson et al. 15626* (MO); Reventador, between Baeza and Lago Agrio, alt. 1600 m, 5 Oct. 1984, *A. Hirtz 1978* (MO). Prov. of Zamora-Chinchipe: between Loja and Zamora, alt. 1600 m, Aug. 1985, *D. D'Alessandro 493* (MO); upriver from Valladolid, alt. 1950 m, 21 Apr. 1986, *D. D'Alessandro 615* (MO); along river south of Zamora, alt. 1000 m, 24 Jan. 1992, *C. Luer, J. Luer, P. Jesup, A. Jesup & A. Hirtz 16138* (MO).

PERU: Dept. of Junín: Chanchamayo Valley, alt. 1800 m, Sept. 1929, *C. Schunke 1158* (AMES, F). Dept. of Huánuco: Río LlullaPichis, ascent on Cerros del Sira, alt. 860 m, 26 July 1969, *F. Wolfe 12383* (NA).

BOLIVIA: Dept. of La Paz: Larecaja, Alto Llipi, alt. 1700 m, collected Aug. 1991, flowered in cultivation in Quito by *A. Hirtz 5694* (MO).

BRAZIL: Edo. São Paulo, Estação Biologica do Alto da Serra, 2 Oct. 1921, *A. Gehrt 7965* (holotype of *P. anomala*: SP).

COLOMBIA: Dept. of Antioquia: Briceño, Río Espirito Santo, 21 May 1963, flowered at Colomborquídeas, 16 Apr. 1988, *C. Luer 13188* (MO); Dabeiba, alt. 1280 m, collected by M. Robledo, flowered in cultivation at La Ceja, 16 Apr. 1988, *C. Luer 13194* (MO); Dept. of Chocó, Río Baudó near Pt. Pizarro, 11 Feb. 1967, *H. P. Fuchs & L. Zanella 22178* (K). Dept. of Valle del Cauca: Alto de Los Galápagos, alt. 2050 m, 13 May 1993, *C. Luer, J. Luer, R. Escobar, A. DeWilde & Julian 16811* (MO). Dept. of Nariño: without specific locality, obtained from J. L. Aguirre, cultivated at J & L Orchids, Easton, CT, 31 May 1997, *C. Luer 18512* (MO).

VENEZUELA: Island of Margarita, alt. 600 m, 16 July 1903, *J. R. Johnston 237* (AMES); 125 km south of El Dorado, alt. 2500 ft., Mar. 1959, *G. C. K. Dunsterville 490*. Terr. Fed. Amazonas: Atures, NW of Yutaje, Río Coro-Coro, alt. 1400-1760 m, 6 Mar. 1987, *R. L. Liesner & B. Holst 21698* (MO, VEN); Río Negro, Cerro Aracamuni, alt. 1550 m, 18 Oct. 1987, *R. L. Liesner & F. Delascio 22128* (MO, VEN).

CUBA: 1861, *C. Wright 105* (W); 1861-64, *C. Wright 3341* (AMES, G, K); Santa Clara, Lomas de Banao, May 1920, *Fr. Luna 524* (AMES, NY); Las Villas, Guanijibe, Zuleta, June 1949, *A. Alonso 15559* (AMES); Sierra de Cristal, Mayari, 2 Apr. 1956, *Hno. Alain, J Acuña & M. Lopez 5452* (AMES).

JAMAICA: without locality, 1857, *Mr. Wilson 160* (holotype of *P. foliata*: K).

DOMINICAN REPUBLIC: Bonao, Casabito, *D. Dod 27* (USD); Villa Altagracia, Loma de Siete Cabezas, *D. Dod 1251* (JBSD); El Valle, Los Haitises, Arroyón, *D. Dod 1255* (JBSD).

HAITI: Massif de la Houte, Formond, *D. Dod 1264* (JBSD).

GRENADA: Annandale, St. George's, on cacao trees, Mar. 1906, *W. E. Broadway 1846* (lectotype of *P. broadwayi*: AMES; isolectotype: K), C. Luer illustr. 16279; *W. E. Broadway 8802* (K).

GUADALUPE: Bois de Bombarîman, monte Haut-Matouba, alt. 810 m, 11 Apr. 1904, *R. P. Duss 4192* (holotype of *P. guadalupensis*: BR; isotypes: AMES, NY).

MARTINIQUE: Donis-Balata, alt. 500 m, 10 Sept. 1937, *H. Stehlé 2139*

ST. KITTS: Camps Mt., alt. 3000 ft., 3 Jan. 1968, *R.A. Howard & L.J. Nevling 16874* (AMES).

PANAMA: Cana and vicinity, alt. 2000-6500 ft., 17 April-8 June 1908, *R. S. Williams 976* (holotype of *P. williamsii*: AMES; isotype: NY). Prov. of Bocas del Toro: forest between Fortuna and Chiriquí Grande, alt. 350 m, 17 Feb. 1985, *C. Luer, J. Luer, R. Dressler & K. Dressler 10609* (MO).

COSTA RICA: Without locality, 1868, *A. Endres 50, 65, 192, 238, 283* (W); without locality, *C. H. Lankester 1207* (AMES). Prov. of Alajuela: Alfero Ruiz, La Peña de Zarcero, alt. 1400 m, 11 May 1938, *A. Smith H-541* (AMES); Finca Poasito, Volcán Poás, alt. 2200 m, 1 May 1949, *L. O. Williams 16665* (AMES); Piedades de San Ramón, alt. 1025 m, 10 June 1926, *A. M. Brenes 1484* (AMES). Prov. of Cartago: pasture near Río Pejibaye, alt. 750 m, 1 Oct. 1972, *R. W. Lent 2965* (CR); Tablazo, alt. 1500 m, 28 May 1978, *C. Todzia 291* (CR); Cerro de La Carpintera, alt. 1500-1800 m, Feb. 1924, *P. C. Standley 34342, 34385, 34469* (AMES); same area, alt. 6000 ft., 3 Apr. 1928, *H. E. Stork 1341* (AMES); La Palma de San Ramón, alt. 1180 m, 4 Nov. 1924, *A. M. Brenes 2296, 2693* (CR); between San Ramón and

Santa Clara, alt. 1080-1200 m, 27 July 1983, *R. Escobar & M. Perez 3098* (CR, SEL); Rincón da la Vieja, 22 Sept. 1984, *R. L. Dressler 32* (CR); Cordillera de Talamanca, alt. 1900 m, 17 Apr. 1949, *L. O. Williams 16373* (AMES); Cerro de la Muerte, collected by Wubben, flowered in cultivation in Holland, *C. Luer 11442* (MO). Prov. of Heredia: Cerros de Zurquí, northeast of San Isidro, alt. 2000-2400 m, 3 Mar. 1926, *P. C. Standley & J. Valerio 50794, 50821* (AMES); Cerro de Las Caricias, north of San Isidro, alt. 2000-2400 m, *C. C. Standley & J. Valerio 52478* (AMES); Los Cartagos, alt. 1900-2000 m, 27 Oct. 1979, *C. Todzia 909* (CR). Prov. of Limón: Parqué Nac. Braulio Carrillo, alt. 550 m, 3 Jan. 1991, *S. Ingram & K. Ferrell 835* (CR, SEL). Prov. of San José: La Hondura, alt. 1300-1700 m, 2 Mar. 1924, *P. C. Standley 36565* (AMES); San Cristóbal, alt. 1800 m, 22 June 1981, *C. Luer, A. Luer & L. D. Gómez 6387* (CR, SEL).

NICARAGUA: Prov. of Granada: Volcán Mombacho, alt. 1100 m, *J. Atwood 12, 307* (HNMN). Prov. of Jinotega: Jinotega Grade, alt. 1260 m, *A. Heller 6325* (SEL).

HONDURAS: Prov. of Cortes: Santa Cruz de Yojoa, alt. 2000 ft., 18 Nov. 1933, *J. B. Edwards 546, 599* (AMES).

EL SALVADOR: Dept. Santa Ana, Cerro Montecristo, alt. 2100 m, *F. Hamer 942*.

GUATEMALA: Prov. of Alta Verapaz: north of Chicayo near Cobán, alt. 5000 ft., Jan. 1878, *H. von Türckheim 50* (W); near Cobán, collected by O. Archila, flowered in cultivation in Cobán, 29 Nov. 1990, *C. Luer 14879* (MO). Prov. of Guatemala: Volcán Pacaya above Las Calderas, *P. C. Standley 58463* (AMES).

MEXICO: Edo. Chiapas: Ocosingo, Laguna Ocotal Grande, alt. 950 m, 20 July-20 Aug. 1954, *R. L. Dressler 1525* (AMES). Edo. Oaxaca: northwest of Pluma Hidalgo, Río Copalito, alt. 1100 m, 14 Apr. 1936, *O. Nagel 6447* (AMES).

The concept treated here as *T. dura* is a common, variable species or species-complex widely distributed from southern Mexico through Central America, the Antilles and the Andes. For the past century, it has been generally recognized as a separate species in each of the three great realms of its distribution. Caribbean collections are customarily identified as *T. foliata*, Central American collections, as *T. broadwayi* (even though described from Trinidad), while the Andean collections are known as *T. dura*. Although this species is variable vegetatively, even within a limited area, the morphology of the flowers is more constant in spite of great variations in size and length of the sepals. Forms with both short sepals (2.5-4 mm) and forms with long sepals (7-8 mm, Fig. 45.) are found intermixed in the Andean distribution. Numerous examinations of both rehydrated flowers and fresh flowers preserved in liquid from numerous, distant localities in both Central and South America and the Caribbean have been made. There are no differences that can be correlated with any feature.

The plants included in *T. dura* are more or less caespitose, but the ramicauls usually proliferate one or two more ramicauls, so that "stems" may bear a few small, elliptical leaves. Sometimes long chains of ramicauls are formed. The several-flowered racemes of yellowish flowers surpass the leaf twice to five times in length. The sepals are carinate and ovate, sometimes slightly acuminate; the apices of the small, membranous petals vary from subacute to rounded; and the oblong lip bears a pair of low, longitudinal calli near the margins with the midvein thickened between them. The thickened, obtuse apex is cellular-glandular in varying degrees. The column is abruptly and broadly winged above the middle, but sometimes indistinctly so.

Trichosalpinx fasciculata Luer & Hirtz, sp. nov. Fig. 46.

Ety.: From the Latin *fasciculatus*, "fasciculate," in reference to the single-flowered inflorescences.

Planta parva caespitosa, pedunculis unifloris fasciculatis folio elliptico leviter longioribus, sepalis purpureis glabris ovatis acutis caudatis, petalis oblongis late obtusis, labello aurantiaco crasso obovato margine supra medium obtuse angulo apice rotundato base subcordato.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 15-25 mm long, enclosed by 4-5 microscopically ciliate-scabrous, lepanthiform sheaths. **Leaf** erect, thickly coriaceous, elliptical, subacute to obtuse, 7-11 mm long, 4-6 mm wide, contracted below into a petiole 2-3 mm long. **Inflorescence** successively 1-flowered, the peduncles filiform, 13-17 mm long, borne in a fascicle from near the apex of the ramicaul; floral bracts 1 mm long; pedicels 3-5 mm long; ovary 0.5 mm long; **sepals** red-purple, glabrous, subcarinate, the dorsal sepal ovate, concave, 8.5 mm long, 2.75 mm wide, 3-veined, connate to the lateral sepals for 0.5 mm, with the apex subacute, contracted into a thickened tail 2.5 mm long, the lateral sepals narrowly triangular, acute, oblique, 7.5 mm long, 1.5 mm wide, connate 1 mm, each 1-veined, the margins above the middle involute to form a tube; **petals** oblong-obovate, broadly obtuse, 2 mm long, 0.75 mm wide, 1-veined; **lip** orange, thick, obovate, 2.6 mm long, 1.5 mm wide, the apex rounded, the margins obtusely angled just above the middle with a small, obscure callus, the disc shallowly channeled above the base, the base subcordate, hinged to the column-foot; **column** terete, 2 mm long, winged above the middle, the anther subapical, the stigma ventral.

ECUADOR: Prov. of Zamora-Chinchipe: Cordillera del Condor, epiphytic in cloud forest east of Los Encuentros, alt. 1550 m, 18 May 1988, *C. Luer, A. Hirtz, W. Flores, A. Andreetta & W. Teague 13467* (Holotype: MO); same area, alt. 1650 m, 13 Feb. 1993, *D. Dalström, T. Höijer & H. Wanntorp 1908* (MO).

This species with a fascicle of single-flowered inflorescences is known only from the Cordillera del Condor in southeastern Ecuador. Very few species of the genus are single-flowered. Several, successive peduncles slightly longer than the leaf are borne in a fascicle from the apex of the ramicaul. The sepals are red-purple and shortly caudate. The petals are obtuse. The lip is orange and obovate with a broadly rounded apex.

Trichosalpinx fissa Luer, sp. nov. Fig. 47.

Ety.: From the Latin *fissus*, "cleft," referring to the deep fissure above the base of the lip.

Planta parva repens, racemo erecto plurifloro foliis anguste ellipticis duplo vel triplolongiore, floribus cleistogamis, sepalis glabris carinatis ovatis, petalis oblongis, et labello crasso trilobato, lobis rotundatis crassis, profunde fisso inter lobos laterales.

Plant small, epiphytic, shortly repent, the rhizome 4-8 mm long between ramicauls; roots slender. Ramicauls erect, 10-15 mm long, enclosed by 2 microscopically ciliate-scabrous, lepanthiform sheaths. **Leaf** erect, thickly coriaceous, narrowly elliptical, acute, 10-23 mm long, 4-7 mm wide, cuneate below into a petiole 1 mm long. **Inflorescence** an erect, secund, subdense, raceme of yellow, cleistogamous flowers, up to 7 cm long, including the filiform peduncle 1-3 cm long, from near the apex of the ramicaul; floral bracts 1.5 mm long; pedicels 1 mm long; ovary 1 mm long; **sepals** glabrous, fleshy, carinate, the dorsal sepal ovate, acute, deeply concave, 4.5 mm long, 3 mm wide expanded, 3-veined, the lateral sepals narrowly ovate, acute, 4 mm long, 0.75 mm wide, 1-veined, connate 2.5 mm; **petals** membranous, oblong, obtuse, 2.25 mm long, 0.75 mm wide, 1-veined; **lip** yellow, fleshy, three-lobed, 3 mm long, 1 mm wide, the apical lobe thick, rounded, the lateral lobes erect, broadly rounded, thick, especially at the base, the disc deeply cleft above the base between the bases of the lateral lobes, the base narrowly truncate, hinged to the column-foot; **column** terete, 2 mm long, the anther subapical, the stigma ventral.

ECUADOR: Prov. of Azuay: epiphytic in scrub vegetation above Lago Zorrogucho, alt. 3200 m, 17 Mar. 1984, *C. Luer, S. Dalström, T. Höijer & J. Kuijt 9534* (Holotype: MO).
VENEZUELA: Edo. Trujillo: Boconó-Guaramacal road, alt. ca. 6000 ft., Aug. 1963, *G.C.K. Dunsterville* illustr. 799.

This little species, known from southern Ecuador, was illustrated by Dunsterville in 1963 in Venezuela. It is recognized by the shortly repent habit, narrowly elliptical leaves, and a slender raceme of several, yellow, cleistogamous flowers. Most distinguishing is the three-lobed lip that is deeply cleft between the thickened bases of the lateral lobes. The cleft was not seen by Dunsterville.

Trichosalpinx fruticosa Luer, sp. nov. Fig. 48.

Ety.: From the Latin *fruticosus*, "bushy," in reference to the habit.

Planta mediocris erectis ramificans, ramicaulibus proliferantibus, racemo plurifloro foliis ellipticis longiori, sepalis glabris anguste ovatis acuminatis, petalis anguste ovatis obliquis acutis, labello obscure trilobo disco longicarinato.

Plant medium in size, epiphytic, erect, branching, up to 15 cm or more tall; roots slender at the base. Ramicauls slender, ascending, prolific, producing another ramical from near the apex, 0.5-7 cm long (the lower ramicauls much the longer), enclosed by 2-8 closely appressed, lepanthiform sheaths with the ostia microscopically scabrous. **Leaf** ascending to erect, thickly coriaceous, elliptical, obtuse, 10-17 mm long, 6-7 mm wide, contracted below into a petiole 1-2 mm long. **Inflorescence** a loose, simultaneously few-flowered raceme 2.5-3 cm long including the filiform peduncle ca. 0.5 cm long, from the apex of a ramicaul; floral bracts 2.5 mm long; pedicels 2.5-3 mm long; ovary 0.5 mm long; **sepals** white, glabrous, carinate, the dorsal sepal narrowly ovate, acute, attenuate, 9 mm long, 1.5 mm wide, 3-veined, connate to the lateral sepals for 0.25 mm, the lateral sepals free, narrowly triangular, oblique, 10 mm long, 1 mm wide, each 1-veined; **petals** membranous, narrowly ovate, oblique, acute, 3 mm long, 0.6 mm wide, 1-veined; **lip** white, oblong-trilobed, 3.25 mm long, 1.25 mm wide across the lobes expanded, the apical half thick, narrowly obtuse, cellular-glandular, the basal half with low, broadly rounded, erect margins difficult to expand, the disc with a longitudinal carina from the base to above the middle, the base subtruncate, hinged to the column-foot; **column** terete, 1.25 mm long, without wings, the anther subapical, the stigma ventral.

COSTA RICA: Prov. of San José: epiphytic on Cerro del Muerte, alt. 2400 m, 21 Mar. 1986, collected by W. Ballesteros, *C. Luer 12135* (Holotype: MO).
GUATEMALA: Prov. of Alta Vera Paz: collected near Cobán by O. Archilla, flowered in cultivation 29 Nov. 1990, *C. Luer 14876* (MO).
EL SALVADOR: Cerro Montecristo, alt. 2100 m, Aug. 1978, *F. Hamer 667* (MO).

Although apparently rare, this species has been found in Guatemala, Costa Rica and El Salvador. In habit, it is similar to *T. cedralensis*, and without doubt, it has been identified as such in many herbaria. The branching ramicauls bear elliptical, obtuse leaves, and a simultaneously flowered raceme of whitish flowers with long-attenuate sepals. *Trichosalpinx fruticosa*, however, is distinguished from all others by acute instead of obtuse petals, and a narrow lip with a distinctive, longitudinal carina down the center.

Trichosalpinx gentryi Luer, sp. nov. Fig. 49.

Ety.: Named in honor of the late Dr. Alwyn Gentry, co-discoverer of this species.

Species haec **T. durae** (Lindl.) Luer affinis, sed floribus minoribus, sepalo dorsali elliptico quam sepalo laterali triangulari majore, petalis obovatis, et labello bicalloso profunde canalliculato differt.

Plant small, epiphytic, scandent; roots slender. Ramicauls erect, prolific, 5 or more superposed, each ramicaul 1.5-2.5 cm long, enclosed by 5-6 microscopically scabrous, lepanthiform sheaths with ciliate ostia. **Leaf** erect, coriaceous, elliptical to broadly elliptical, obtuse, 10-16 mm long, 6-9 mm wide, contracted below into a petiole 1 mm long. **Inflorescence** a loose, simultaneously several-flowered raceme, 3-4.5 cm long, including the filiform peduncle 1-1.5 cm long, from near the apex of the ramicaul; floral bracts 0.75-1 mm long, with ciliate ostia; pedicels 1-2 mm long; ovary 0.5 mm long; **sepals** yellow, glabrous, carinate, the dorsal sepal ovate, acute, concave, 2.5 mm long, 1.2 mm wide, 3-veined, the lateral sepals free, triangular, oblique, acute, 2 mm long, 0.6 mm wide, 1-veined; **petals** translucent, obovate, 1 mm long, 0.4 mm wide, 1-veined, rounded at the apex; **lip** yellow, oblong, 1.75 mm long, 0.5 mm wide, with the margins low and broadly rounded below the middle, thickened toward the apex, cellular-glandular, rounded, the disc with a longitudinal calli within the margins, sulcate between, the base subcordate, hinged to the column-foot; **column** terete, broadly winged above the middle, 1.25 mm long, the anther subapical, the stigma ventral.

PERU: Dept. of Pasco: Northwest of Villa Rica toward Puerto Bermudez, alt. 700 m, 4 Mar. 1982, *A. Gentry & D. Smith 36075* (Holotype: MO), C. Luer illustr. 17498.

This species is closely allied to the common and variable *T. dura*. It is characterized by a scandent habit with five or more superposed ramicauls with small, broadly elliptical leaves. The elliptical dorsal sepal of the extremely small flowers is distinctly larger than the triangular lateral sepals. The petals are obovate, but this is easily included among the variations found in *T. dura*. The lips of the two species are also similar except that instead of being tricarinate, the disc of the lip of *T. gentryi* is deeply sulcate between an outer pair of longitudinal calli.

Trichosalpinx hamiltonii Luer, sp. nov. Fig. 50.

Ety.: Named in honor of A. C. Hamilton who with P. M. Holligan discovered this species.

Planta parva caespitosa, ramicaulibus gracilibus folio elliptico parvo multilongioribus, racemis paucis laxe paucifloris folio multilongioribus, sepalis acutis, petalis ellipticis et labello elliptico infra medium obscure lobato disco cum lamella supra basim.

Plant small, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 5-7 mm long, enclosed by 6-7 closely appressed, microscopically scabrous, lepanthiform sheaths. **Leaf** erect, coriaceous, suffused with purple beneath, elliptical, subacute, 14-16 mm long including the petiole 2-3 mm long, 4-5 mm wide, cuneate below into the petiole. **Inflorescence** a loose, secund, simultaneously 3- to 4-flowered raceme, 5-7 cm long, including the filiform peduncle 2.5-4 cm long, from near the apex of the ramicaul; floral bracts 1.5-2 mm long; pedicels 2-3 mm long; ovary 1 mm long; **sepals** translucent pale red or yellow, glabrous, subcarinate, the dorsal sepal ovate, acute, slightly acuminate, 8-9 mm long, 3.2 mm wide, 3-veined, free from the lateral sepals, the lateral sepals narrowly triangular, acute, 9-10 mm long, 1.5 mm wide, 1-veined, connate 1.5 mm; **petals** translucent, elliptical, obtuse, 5 mm long, 2 mm wide, 1-veined; **lip** red or yellow, elliptical-ovate, obscurely 3-lobed, 5 mm long, 2 mm wide expanded, the apex narrowly rounded, with obscure, suberect, broadly rounded lobes in the basal third, the base slightly unguiculate with a longitudinal keel on the basal third of the disc, hinged to the column-foot; **column** terete, slender, 2 mm long, the anther subapical, the stigma ventral.

PERU: Dept. of San Martín: Huallaga, valley of Río Apisoncho, alt. 3600 m, 12 Aug. 1965, *A. C. Hamilton & P. M. Holligan 1265* (Holotype: MO), C. Luer illustr. 16400; same locality and date, *A. C. Hamilton & P. M. Holligan 1263, 1264* (K).

This species is apparently endemic at a high altitude in northcentral Peru where it was collected on the Cambridge Botanical Expedition to northern Peru in 1965. It is distinguished by slender ramicauls much longer than the small, elliptical leaves. The few-flowered, loose, strict raceme, accompanied by two to four old, spent racemes, far surpass the leaf.The proportionately large flowers vary in color from red to yellow on the specimens collected and segregated by Hamilton. The sepals are acute, and the petals and lip are elliptical and obtuse. A keel is present on the subunguiculate base of the lip.

Trichosalpinx hirtzii Luer, sp. nov. Fig. 51.

Ety.: Named in honor of Alexander C. Hirtz of Quito, Ecuador, who discovered this species.

Planta parva pendens, ramicaulibus proliferantibus, racemo paucifloro foliis semiteretibus breviore, sepalis petalisque glabris ovatis subacutis, labello trilobato, lobo antico ovato, lobis lateralibus erectis supra medium obtusis.

Plant small, epiphytic, prolific, pendent, up to 30 cm long; roots slender at the base. Ramicauls descending, slender, producing another ramical from the apex, 15-20 mm long, enclosed by 3-4 red, closely appressed, microscopically ciliate, lepanthiform sheaths. **Leaf** descending, thickly coriaceous, narrowly elliptical, fusiform, acute, 22-32 mm long, 3.5 mm wide, 3 mm thick, cuneate below into a petiole 1 mm long. **Inflorescence** a loose, successively 2- to 3-flowered raceme, 10-15 mm long, including the filiform peduncle 8-10 mm long, from near the apex of the ramicaul; floral bracts 1.2 mm long; pedicels 2-2.5 mm long; ovary 0.75 mm long; **sepals** translucent purple, glabrous, subcarinate, ovate, with subacute, slightly thickened apices, the dorsal sepal 5 mm long, 3 mm wide, 3-veined, connate to the lateral sepals for 0.5 mm, the lateral sepals 5 mm long, 2 mm wide, 1-veined, connate 1 mm; **petals** translucent purple, ovate, subacute, 3 mm long, 1.5 mm wide, 1-veined; **lip** dark purple, fleshy, three-lobed, 3 mm long, 2 mm wide expanded, the apical lobe ovate, narrowly obtuse, constricted at the base, cellular glandular, the lateral lobes erect, broadly rounded with an obtuse, antrorse angle above the middle, the disc cleft between glandular calli at the anterior margins of the lateral lobes, the base narrowly truncate, hinged to the column-foot; **column** terete, 2 mm long, the anther apical, the stigma ventral.

ECUADOR: Prov. of Zamora-Chinchipe: epiphytic in cloud forest east of the pass east of Loja, alt. 2250 m, 25 Jan. 1992, *C. Luer, J. Luer, P. Jesup, A. Jesup & A. Hirtz 16167* (Holotype: MO).

This rare species found in southern Ecuador, is distinguished by long, flexible, pendent chains of red ramicauls and green, fusiform leaves. The pendent, purple flower is produced successively in a hanging, few-flowered raceme shorter than the leaf. The sepals and petals are simple, but the lip is deeply trilobed. The anterior lobe is ovate, constricted at the base and cellular-glandular, while the lateral lobes are obtuse and extending above the middle.

Trichosalpinx inaequisepala (C.Schweinf.) Luer, Phytologia 54: 395, 1983. Fig. 52.
Bas.: *Pleurothallis inaequisepala* C.Schweinf., Bot. Mus. Leafl. 10: 180, 1942.

Ety.: From the Latin *inaequisepalus*, "with unequal sepals," referring to the disparity in size of the dorsal and lateral sepals (a finding in practically all species in the subgenus).

Plant very small, epiphytic, caespitose; roots slender. Ramicauls erect, slender, occasionally prolific in the type, 5-20 mm long, enclosed by 2-5 closely appressed, lepanthiform sheaths with ciliate ostia. **Leaf** erect, thickly coriaceous, elliptical, subacute to obtuse, 8-10 mm long, 4-5 mm wide, contracted below into a petiole 1 mm long. **Inflorescence** a loose, simultaneously 2- to 4-flowered raceme 3-6 mm long including the peduncle 1-2 mm long, from near the apex of a ramicaul; floral bracts 1 mm long; pedicels 1 mm long; ovary 0.4 mm long; **sepals** yellow with purple veins, glabrous, subcarinate, the dorsal sepal ovate, deeply concave, 2.5 mm long, 2 mm wide expanded, obscurely 3-veined, with the obtuse apex contracted into a tail 0.4 mm long, connate to the lateral sepals for 0.5 mm, the lateral sepals narrowly ovate, oblique, acute, 2.25 mm long, 0.66 mm wide, connate 0.5 mm, each 1-veined; **petals** elliptical, oblique, subsigmoid, 1.5 mm long, 0.5 mm wide, 1-veined, with the margins somewhat irregular; **lip** yellow, ovate, concave, 1.1 mm long, 0.9 mm wide, the apex subacute, cellular-glandular, the disc featureless, the base truncate, hinged to the column-foot; **column** terete, stout, 0.66 mm long, with a thick foot, the anther subapical, the stigma ventral.

PERU: Dept. of Cuzco: Valle de Santa Ana, alturas del Chaco, alt. 3666 m, 12 Aug. 1928, *F. L. Herrera 2125* (Holotype: US; Isotype: AMES).
BOLIVIA: Dept. of La Paz: Nor Yungas, epiphytic near the pass at Chuspipata between Unduavi and Coroico, alt. 3000 m, collected in Aug. 1991 by A. Hirtz et al., flowered in cultivation in Quito, Dec. 1991, *A. Hirtz 5579* (MO), C. Luer illustr. 16214.

This little species occurs in southeastern Peru and northwestern Bolivia. It is characterized by the short, few-flowered raceme of tiny flowers with a proportionately large, deeply concave dorsal sepal with a short tail. The petals are oblique and acute, and the lip is elliptical-ovate or rhomboid with a subacute apex.

Trichosalpinx intricata (Lindl.) Luer, Phytologia 54: 396, 1983. Fig. 53.
Bas.: *Pleurothallis intricata* Lindl., Orchid. Linden. 1, 1846.
Ety.: From the Latin *intricatus*, "intricate, or entangled," in allusion to the tangled mass of the type.
Syn.: *Humboldtia intricata* (Lindl.) Kuntze, Rev. Gen. Pl. 2: 667, 1891.

Plant small, epiphytic, densely caespitose to occasionally shortly scandent; roots slender. Ramicauls slender, erect, occasionally prolific, 1-4 cm long, enclosed by 3-6 closely appressed, microscopically ciliate, lepanthiform sheaths. **Leaf** erect, coriaceous, elliptical, subacute to obtuse, 8-15 mm long including the petiole 1-2.5 mm long, 4-5 mm wide, cuneate below into the petiole. **Inflorescence** a loose, flexuous, more or less simultaneously 3- to 6-flowered raceme, 3-6 cm long, including the filiform peduncle 2-2.5 cm long, from near the apex of the ramicaul; floral bracts 1-1.5 mm long; pedicels 4-8 mm long; ovary 1 mm long; **sepals** translucent pale yellow, glabrous, subcarinate, the dorsal sepal ovate below the middle, concave, acute, long-acuminate, 5-6.5 mm long, 1.5-2 mm wide, 3-veined, free from the lateral sepals, the lateral sepals narrowly linear-triangular, acute, 5-6 mm long, 0.5-0.75 mm wide, 1-veined, connate 0.5 mm; **petals** translucent, elliptical, oblique, 1.75-2.25 mm long, 0.6-0.75 mm wide, faintly 1-veined, the apex subacute to obtuse, sometimes microscopically erose, wide; **lip** yellow, ovate-trilobed, 1.75-2.25 mm long, 0.75 mm wide, 2 mm wide across the expanded lobes, the apical lobe narrowly ovate, narrowly rounded at the apex, with the lateral lobes below the middle, erect, obtuse to subacute, the disc with a small callus near the forward angle of lateral lobes, the base subunguiculate, hinged to the column-foot; **column** terete, 1-1.5 mm long, the anther subapical, the stigma ventral.

VENEZUELA: Edo. Mérida: Mérida, alt. 1600 m, 1842, *J. Linden 668* (Holotype: K; Isotypes: AMES, BR, G, W); Páramo La Negra, 15 Apr. 1954, *V. Vareschi 3274* (AMES). Edo. Sucre: Peninsula de Paria, alt. 760-1000 m, 24 Feb. 1980, *J. A. Steyermark, R. Liesner & V. Carreño 121727* (MO, VEN). Edo. Trujillo: Carache, Páramo Jabon, alt. 3150 m, 28 May 1988, *L. J. Dorr, L. C. Bennett, R. Rivera & W. Diaz, 5333* (AMES, NY).

COLOMBIA: Mariquita, 1849, *J. Triana 122* (K, W); Dept. of Antioquia: without locality, *G. Schmidtchen s.n.* (W). Dept. of Cauca: Munchique, alt. 3000 m, 25 Sept. 1939, *K. von Sneidern 2036* (S). without locality, *F. C. Lehmann 283* (W). Dept. of Chocó: San José del Palmar, Cerro del Torrá, alt. 2050 m, 10 Jan. 1984, *F. A. Silverstone-Sopkin et al. 1740* (CUVC, MO); alt. ca. 1950 m, 8 Aug. 1988, *F. A. Silverstone-Sopkin et al. 4148* (CUVC, MO); same area, alt. 2500 m, 25 Aug. 1988, *F. A. Silverstone-Sopkin et al. 4791* (CUVC, MO). Dept. of Cundinamarca: near Gutiérrez, alt. 2800-3000 m, 2 Apr. 1950 m, *M. Schneider 268* (AMES, S). Dept. of Norte de Santander: Alto de Pozo above Villacaro, alt. 2400 m, 5 May 1982, *C. Luer, J. Luer, R. Escobar & E. Valencia 7737* (SEL); Páramo de Jurisdicciones, alt. 3150 m, 10 May 1984, *C. Luer, J. Luer, E. Escobar & E. Valencia 10234* (MO); Alto de Mefue north of Toledo, alt. 2600 m, 12 May 1984, *C. Luer, J. Luer, E. Escobar & E. Valencia 10294* (MO). Dept. of Valle del Cauca: La Cumbre, summit of west peak, alt. 2100-2400 m, 11 Sept. 1922, *E. P. Killip 11403* (AMES, NY).

ECUADOR: Prov. of Azuay: west slopes of Cuenca around Shagál, alt. 2200-2500 m, Oct. 1892, *F. C. Lehmann s.n.* (K), C. Luer illustr. 16402. Prov. of Bolívar: between Chillanes and San Vicente, alt. 2100 m, Feb. 1991, flowered in cultivation at Chamblee, GA, *F L Stevenson 92-0228-3* (MO). Prov. of Loja: NW of El Cisne, alt. 2400 m, 19 Feb. 1988, *U. Molau & B. Eriksen 3088* (GB). Prov. of Morona-Santiago: southeast of Sigsig, alt. 2400 m, 13 Jan. 1989, *C. Luer, J. Luer, P. Jesup, A. Jesup, A. Hirtz & S. Ortega 13867* (MO); Cordillera del Condor, east of Los Encuentros, alt. 1600 m, 4 Feb. 1987, *C. Luer, J. Luer & A. Hirtz 12621* (MO). Prov. of Napo: between Baeza and Tena, alt. 2050 m, 30 June 1985, *C. H. Dodson & A. Hirtz 15912* (MO); Volcán Reventador, alt. 1900 m, Apr. 1990, *A. Hirtz 4815* (MO); Volcán Sumaco, Río Hollin, 13 Aug. 1991, *A. Hirtz & S. Ortega 5399* (MO); between Hollin and Loreto, alt. 1200 m, collected Feb. 1991, flowered in cultivation at Chamblee, GA by *F L Stevenson 92-0228-2* (MO); north of Puyo, alt. 1000 m, 12 Apr. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 11210* (MO); north of Archidona, alt. 1200 m, 13 Apr. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 11221* (MO). Prov. of Pastaza: near Mera, alt. 1100 m, 24 Feb. 1972, *G. Harling 11022* (GB); 2 km north of Mera, alt. 1050 m, 27 Feb. 1985, *C. H. Dodson, P. M. Dodson, D. Neill & J. Zaruma 15613* (MO); north of Mera, alt. 1350 m, 12 Apr. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 11193* (MO); Río Zuñag, alt. 2300 m, Feb. 1990, *A, Hirtz et al. 4858* (MO). Prov. of Pichincha: San Florencia, west slope of Corazón, alt. 1800 m, *F. C. Lehmann 354* (W). Prov. of Zamora-Chinchipe: Cordillera del Condor, east of Mayaicu, alt. 1500 m, 20 May 1988, *C. Luer, A. Hirtz, W. Flores, A. Andreetta & W. Teague 13520* (MO); Nudo de Sabanilla, above Valladolid, alt. 2800 m, 4 Feb. 1985, *G. Harling & L. Andersson 21569* (GB).

PERU: Dept. of Cuzco: Convención, Hda. Patrio Sapa Sachayoca, alt. 2200 m, 5 Mar. 1942, *C. Vargas 2535* (AMES); Ajanacui, alt. 3400 m, 11 Dec. 1942, *C. Vargas 3005* (CUZ, MO); La Convención, between Santa Teresa and Chaullay, alt. 1200-2600 m, 1 Jan. 1988, *P. Nuñez & Motocanchi 8819* (MO). Dept. of Huánuco: Río LlullaPichis on ascent of Cerros del Sira, alt. 2100 m, 30 July 1969, *T.R. Dudley 13451* (NA).

This little species, first collected by Linden in 1842 in western Venezuela, is frequent and variable in its wide distribution at medium to relatively high altitudes in the Andes from Venezuela into central Peru. Closely related species are found within its range as well as beyond its range. The ramicauls of *T. intricata* are slender and usually densely caespitose, occasionally with some ramicauls being superposed. The capillary rachis, far surpassing the small, elliptical leaf, bears the delicate flowers simultaneously on comparatively long pedicels in a loose, distichous raceme. The apices of the sepals are long-attenuate; the membranous petals are subacute; and the lip is three-lobed below the middle with a tiny, mammillate callus on the disc at the base of each lobe. A specimen with exceptionally long sepals, up to 15 mm long, was collected west of Cuenca a century ago.

A similar but vegetatively much smaller species with a similar lip and shorter, fewer-flowered racemes is known as *T. pusilla*. Another very closely related species, *T. scabridula*, is distinguished by scandent, prolific ramicauls. Another long-scandent species with larger, long-acuminate sepals is *T. notosibirica*. Other related species but with lips lacking mammillate calli are known as *T. acremona*, *T. cedralensis* and *T. multicuspidata*. Occasional specimens intermediate between *T. intricata* and one of its relatives is encountered.

Trichosalpinx jimburae Luer & Hirtz, sp. nov. Fig. 54.

Ety.: Named for the community of Jimbura in southernmost Ecuador near the locality where this species was discovered.

Species haec *T. pusillae* (H.B.K.) Luer affinis, sed foliis leviter majoribus, racemis fasciculatis folio elliptico brevioribus et labelli lobis minoribus inconspicuis differt.

Plant small, epiphytic, densely caespitose; roots slender. Ramicauls erect, slender, 1-2 cm long, enclosed by 3 microscopically ciliate, lepanthiform sheaths. **Leaf** erect, thickly coriaceous, elliptical, subacute or obtuse, 8-13 mm long including a petiole 2-3 mm long, 4-6 mm wide, cuneate below into the petiole. **Inflorescence** a fascicle of 3-5 loose, successively 2- to 3-flowered racemes 5-6 mm long including the filiform peduncles 2-3 mm long, from a node below the apex of the ramicaul; floral bracts 1 mm long; pedicels 1.5 mm long; ovary 0.75 mm long; **sepals** yellow-white with purple veins, glabrous, subcarinate, the dorsal sepal ovate-triangular, concave, acute, lightly acuminate, 6 mm long, 2.5 mm wide, 3-veined, barely connate to the lateral sepals, the lateral sepals narrowly triangular, oblique, acute, 5.5 mm long, 0.75 mm wide, each 1-veined, connate 1.5 mm; **petals** light yellow, translucent, elliptical, acute, oblique, 3 mm long, 1 mm wide, 1-veined; **lip** light yellow, oblong, sub-trilobed, 2.5 mm long, 1 mm wide, the apical lobe oblong, cellular, with the apex rounded, the lateral lobes below the middle, low, erect, broadly rounded, the disc with an obscure pair of low calli at the anterior margin of bases of the lobes, the base unguiculate-truncate, hinged to the column-foot; **column** semiterete, 2 mm long, the foot short, the anther and stigma ventral.

ECUADOR: Prov. of Zamora-Chinchipe: epiphytic in scrubby cloud forest above Jimbura, alt 3350 m, 21 Mar. 1984, *C. Luer, S. Dalström, T. Höijer & J. Kuijt 9648* (Holotype: MO).

This species is apparently endemic in a high-altitude elfin forest in southernmost Ecuador, where several other species of the genus are also apparently endemic. Vegetatively, the plants are small, densely caespitose with elliptical-petiolate leaves. The short inflorescences, shorter than the leaves, are produced in fascicles. The flowers are similar to those of *T. pusilla*, but the basal lobes of the lip are low and inconspicuous with vestigial calli at their forward angles with the middle lobe.

Trichosalpinx lamellata Luer, sp. nov. Fig. 55.

Ety.: From the Latin *lamellatus*, "with a lamella," referring to the lamellate disc of the lip.

Planta parva caespitosa, racemo secundo foliis anguste ellipticis rubrostriatis longiore, sepalis acuminatis dorsali quam lateralibus latioribus, petalis obtusis, labello trilobato, lobis obtusis infra medium, disco basi unilamellato.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect, 10-30 mm long, enclosed by 3-4 microscopically ciliate, lepanthiform sheaths. **Leaf** erect, gray-green with red midvein, thickly coriaceous, narrowly elliptical, acute, 10-18 mm long, 2-4 mm wide, contracted below into a petiole ca. 2 mm long. **Inflorescence** a loose, secund, simultaneously 5- to 6-flowered raceme, 3-4 cm long, including the filiform peduncle 1-1.5 cm long, from near the apex of the ramicaul; floral bracts 1.5-2 mm long; pedicels 1.5 mm long; ovary 0.5 mm long; **sepals** yellow, glabrous, subcarinate, the dorsal sepal ovate and concave below the middle, acute, acuminate, 7 mm long, 3 mm wide expanded, 3-veined, barely connate to the lateral sepals, the lateral sepals narrowly triangular, 7 mm long, 0.75 mm wide, 1-veined, connate 1 mm; **petals** translucent, elliptical-obovate, obtuse, 2.75 mm long, 1.5 mm wide, 1-veined; **lip** yellow, ovate-trilobed, 3.25 mm long, 1.75 mm wide across the lobes, the apical lobe gradually narrowed to a rounded tip, the lateral lobes below the middle, low, erect, broadly rounded, the disc with a tall, longitudinal, entire lamella on the basal half, the base truncate, hinged to the column-foot; **column** terete, 2 mm long, the anther subapical, the stigma ventral, the foot less than 1 mm long.

ECUADOR: Prov. of Loja: Cachiyacu, south of Yangana, alt. 2250 m, 7 May 1986, *D. D'Alessandro 652* (Holotype: MO); same area, alt. 2250 m, 11 May 1981, *C. Luer, J. Luer, & D. D'Alessandro 6215* (SEL); Cajanuma, south of Loja, alt. 2400 m, *R. Espinosa 328* (AMES).

This species is similar to several others of the genus that are related to the frequent, widely distributed, and variable *T. intricata*. *Trichosalpinx lamellata*, apparently endemic in southern Ecuador, is distinguished by the densely caespitose habit with ramicauls about as long as the small, narrowly elliptical leaves. The leaf is

gray-green suffused with red along the midvein. The secund raceme is considerably longer than the leaves. The three-lobed lip similar to that of all its relatives except that it lacks mammillate calli at the front angle of the lateral lobes, and possesses instead a tall, midline lamella on the basal half. The lip is similar to that of *T. tenuis* except that the tall callus of the latter is much lower, and grooved or cleft.

Trichosalpinx lenticularis (Luer) Luer, comb. nov. Fig. 56.

Bas.: *Pleurothallis lenticularis* Luer, Selbyana 3: 132, 1976.

Ety.: From the Latin *lenticularis*, "shaped like a lens," in allusion to the shape of the leaf.

Plant small, epiphytic, caespitose, occasionally shortly prolific; roots slender. Ramicauls erect, slender, sometimes producing another ramicaul from the apex, 1-3 cm long, enclosed by 3-4 microscopically ciliate, lepanthiform sheaths. **Leaf** erect, thickly coriaceous with convex surfaces, often striped in purple, elliptical, subacute to obtuse, 4-12 mm long, 4-8 mm wide, cuneate below into a petiole 1 mm long. **Inflorescence** a solitary flower or a loose, 2- to occasionally 3-flowered raceme, 15-25 mm long including the filiform peduncle 10-15 mm long, from near the apex of a ramicaul; floral bracts 1-1.5 mm long; pedicels about 4 mm long; ovary 0.5-0.75 mm long; **sepals** pale yellow or rose to pale rose suffused with purple along the veins, glabrous, carinate, the dorsal sepal ovate and concave below the middle, with the apex acute, acuminate, 9-10 mm long, 2-3 mm wide, 3-veined, barely connate to the lateral sepals, the lateral sepals narrowly triangular, oblique, acute, 9-10 mm long, 1-1.25 mm wide, each 1-veined, connate 1-1.5 mm; **petals** translucent, sometimes suffused with purple along the midvein, elliptical, subacute to obtuse, 3 mm long, 1.5 mm wide, 1-veined; **lip** yellowish, variously suffused with purple or brown, ovate-trilobed, 3.5-4 mm long, 1.5 mm wide across the lobes, the apical lobe oblong with the apex rounded, the lateral lobes in the lower third, low, erect, oblique, obtuse and antrorse, the disc with a low, rounded callus at the forward angles of the lobes, the base subunguiculate-truncate, hinged to the column-foot; **column** semiterete, 2 mm long, the foot short, the anther and stigma ventral.

ECUADOR: Prov. of Zamora-Chinchipe: epiphytic in elfin forest east of the pass east of Loja, alt. 2700 m, 7 Aug. 1975, *C. Luer, G. Luer & S. Wilhelm 653* (Holotype: SEL); at the pass between Loja and Zamora, alt. 2800 m, 20 Mar. 1972, *G. Harling 11328* (GB); same area, alt. 2750 m, 19 Apr. 1973, *L. Holm-Nielsen, S. Jeppesen, B. Løjtnant & B. Øllgaard 3838, 3957* (AAU, AMES); same area, alt. 2750 m, 21 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10716* (MO); Nudo de Sabanilla, above Valladolid, alt. 2800 m, 4 Feb. 1985, *G. Harling & A. Andersson 21585* (GB). Horta-Naque, alt. 3500 m, 9 Nov. 1946, *R. Espinosa 987* (AMES, LOJA). Prov. of Loja: west of the pass between Loja and Zamora, alt. 2400-2700 m, 17 June 1979, *B. Løjtnant, A. & U. Molau 15036* (AAU, GB). Parqué Nacionál Podocarpus, alt. 2800-2950 m, 23 Feb. 1985. *Øllgaard et al. 57999* (AAU); same area, alt. 2800-3000 m, 14 May 1988, *B. Øllgaard et al. 74089* (AAU); same area, alt. 2900-3000 m, 10 Apr. 1989, *J. E. Madsen 85951* (AAU); Cerro Toledo SE of Yangana, alt. 3000-3200 m, 6 Apr. 1985, *G. Harling & L. Andersson 23798* (GB); south of Yangana, alt. 2400 m, 23 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10873* (MO);

This species is apparently endemic in the windswept elfin forests at high altitudes in southeastern Ecuador. It occurs within the wide distribution of *T. pusilla*, to which it is closely allied. *Trichosalpinx lenticularis* is distinguished from the latter by the larger habit with larger flowers with purple-striped sepals ten millimeters long. Both species are characterized by a three-lobed lip with mammillate calli at the forward angles of the lobes.

Trichosalpinx ligulata Luer & Hirtz, sp. nov. Fig. 57.

Ety.: From the Latin *ligulatus*, "ligulate," referring to the tongue-shaped lip.

Species haec *T. intricatae* (Lindl.) Luer affinis, sed floribus majoribus et labello obscure lobato plano differt.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect, 5-17 mm long, enclosed by 3-5 microscopically ciliate, lepanthiform sheaths. **Leaf** erect, red-purple, coriaceous, broadly elliptical, obtuse, 5-8 mm long, 3-4.5 mm wide, contracted below into a petiole 1 mm long. **Inflorescence** a loose, simultaneously few-flowered raceme, up to 2.5 cm long, including the filiform peduncle 1-1.5 cm long,

from near the apex of the ramicaul; floral bracts 1 mm long; pedicels 4-6 mm long; ovary 0.5 mm long; **sepals** white, glabrous, subcarinate, the dorsal sepal narrowly ovate, concave, acute, long-acuminate, 15 mm long, 2.5 mm wide, 3-veined, connate to the lateral sepals for 0.25 mm, the lateral sepals narrowly ovate, 15 mm long, 1.5 mm wide, 1-veined, connate 1 mm; **petals** translucent, obovate, obtuse, subunguiculate, 3 mm long, 1 mm wide, 1-veined; **lip** white, oblong, 4.25 mm long, 1.5 mm wide, with the margins obscurely rounded above the base, the apex rounded, the disc featureless, the base narrowly truncate, hinged to the column-foot; **column** terete, 2 mm long, the anther subapical, the stigma ventral.

ECUADOR: Prov. of Morona-Santiago: epiphytic in cloud forest at the pass above San Juan Bosco toward Gualaceo, alt. 2350 m, 28 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10993* (Holotype: MO); epiphytic in cloud forest east of Gualaceo above Limón, alt. 2150 m, 16 May 1988, *C. Luer, A. Hirtz, W. Flores, A. Andreetta & W. Teague 13400* (MO). Prov. of Zamora-Chinchipe: Cordillera del Condor, epiphytic in forest east of Los Encuentros, alt. 1800 m, 22 Jan. 1989, *C. Luer, J. Luer, P. Jesup & A. Jesup 14049* (MO).

In habit, this species of the eastern declivities of the Andes of Ecuador is similar to the relatively frequent and widely distributed *T. intricata*. *Trichosalpinx ligulata* differs in having flowers with longer sepaline tails, and an essentially lobeless lip without the pair of characteristic mammillate calli found on the disc near the forward angles of the lobes of the lip of *T. intricata*.

Trichosalpinx macphersonii Luer, sp. nov. Fig. 58.

Ety.: Named in honor of Dr. Gordon McPherson of the Missouri Botanical Garden, who discovered this species.

Species haec *T. scabridulae* (Rolfe) Luer similis, sed foliis marginatis minute denticulatis et ramicaulium vaginarum ostiis dilatatis longiciliatisque differt.

Plant very small, epiphytic, prolific; roots slender at the base. Ramicauls erect, slender, producing another ramical from the apex, 6-8 mm long, enclosed by 3-4 lepanthiform sheaths with long-ciliate, dilated ostia. **Leaf** 3-striped with purple beneath, erect, coriaceous, with margins minutely denticulate and margined, broadly elliptical, obtuse to rounded at the apex, 7-8 mm long, 4-5 mm wide, broadly cuneate or rounded below into a petiole 1-1.5 mm long. **Inflorescence** a loose, subflexuous, simultaneously few-(4-)flowered raceme 17 mm long including the filiform peduncle 10 mm long on the only specimen, from near the apex of a ramicaul; floral bracts 1 mm long; pedicels 5 mm long; ovary 0.3 mm long; **sepals** white, pale green toward the tips, glabrous, carinate, the dorsal sepal ovate-triangular and concave below the middle, acute, acuminate above the middle, 7 mm long, 1.5 mm wide, 3-veined, barely connate to the lateral sepals, the lateral sepals connate at the base, narrowly triangular, attenuate, acute, oblique, 7 mm long, 0.75 mm wide, 1-veined; **petals** membranous, elliptical, oblique, subacute, 1.5 mm long, 0.6 mm wide, without a visible vein; **lip** yellowish, oblong-subtrilobed, 1.8 mm long, 0.75 mm wide across the lobes expanded, the apical lobe oblong with the apex rounded, the lateral lobes low, erect, broadly rounded below the middle, with a very small, obscure callus at the forward angle of the lobes, and a low, longitudinal callus above the base, the base truncate, hinged on the end to the column-foot; **column** clavate, obtusely winged at the apex, 1 mm long, the foot 0.5 mm long, the anther subapical, the stigma ventral.

PANAMA: Prov. of Panama: vicinity of Cerro Jefe, alt. 700-800 m, 23 July 1988, *G. McPherson 12777* (Holotype: MO), C. Luer illustr. 17302.

This little species is known from only a single specimen that was collected in 1988 by Gordon McPherson in a well-botanized area near Panama City. The inflorescence is very similar in all respects to that of the Andean *T. scabridula*. Vegetatively, however, it is very distinct. The sheaths of comparatively stout ramicauls are long-ciliate along the dilated margins of the ostia. The leaves are similar in size, but the margins are minutely denticulate, a character found in many species of several genera on the island of Hispaniola. To my knowledge, only one other species of *Trichosalpinx*, the Central American *T. membraniflora*, has similar, minutely denticulate margins of the leaves. In addition, the leaves of *T. macphersonii* are conspicuously suffused with purple beneath along the three veins.

Trichosalpinx membraniflora (C.Schweinf.) Luer, Phytologia 54: 396, 1983. Fig. 59.

Bas.: *Pleurothallis membraniflora* C.Schweinf,, Bot. Mus. Leafl. 5: 91, 1938.

Ety.: From the Latin *membraniflorus*, "with membranous flowers," referring the flowers.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect to suberect, prolific, often 2-3 superposed, each 10-20 mm long, enclosed by 3-4 microscopically ciliate, lepanthiform sheaths. **Leaf** erect, thickly coriaceous, with minutely denticulate, hyalin margins, elliptical, obtuse, 6-10 mm long, 5-6 mm wide, contracted below into a petiole 1 mm long. **Inflorescence** a loose, successively 3- to 4-flowered raceme, 10-15 mm long, including the filiform peduncle ca. 10 mm long, from near the apex of the ramicaul; floral bracts 0.5 mm long; pedicels 1 mm long; ovary 0.5 mm long; **sepals** yellowish white, glabrous, carinate, the dorsal sepal ovate, concave, acute, 2.5 mm long, 1 mm wide, 3-veined, the lateral sepals narrowly ovate, oblique, acute, 2.25 mm long, 0.8 mm wide, 1-veined, lightly adherent, connate basally; **petals** translucent, elliptical, subacute, 0.75 mm long, 0.2 mm wide, without a vein; **lip** pale yellow, elliptical-oblong, 1.3 mm long, 0.6 mm wide, the apex broadly rounded, the disc slightly thickened with 3 veins, the base broadly rounded, hinged to the column-foot; **column** terete, with apical, antrorse wings, 0.75 mm long, with a pair of obtuse calli above the obsolescent foot, the anther apical between the columnar wings, the stigma ventral.

COSTA RICA: Prov. of Alajuela: Palmira, San Pedro de San Ramón, 29 July 1935, *A. M. Brenes 20571* (Holotype: AMES).
PANAMA: Prov. of Coclé: epiphytic in orange grove above El Valle, alt. 1000 m, 2 Sept. 1976, *C. Luer & H. Butcher 1121* (SEL); same area, alt. 900 m, 20 Feb. 1985, *C. Luer, J. Luer, R. Dressler & K. Dressler 11393* (MO).

Superficially, this little species is similar to *T. dura* in habit. Apparently unique, however, are minutely denticulate margins of the leaves as found in many species of orchids from Hispaniola. Otherwise, *T. membraniflora* is distinguished by the short inflorescence that bears only three or four pale yellow, tiny flowers in slow succession. The sepals are carinate and acute; the minute, elliptical petals are without a discernible vein; the lip is oblong with the apex and base broadly rounded; and the disc of the lip is only slightly thickened with three veins. A pair of wings extends forward from the apex of the column to flank the anther, similar to the columnar wings of *T. tropida*.

Trichosalpinx metamorpha Luer & Hirtz, sp. nov. Fig. 60.

Ety.: From the Greek *metamorphos*, "changing from one form into another," in reference to the two vegetative forms.

Planta mediocris dense caespitosa, ramicaulibus sterilibus foliis ellipticis multibrevioribus, ramicaulibus fructificantibus folio elliptico minore multilongioribus, racemis paucis secundis saepe coaetaneis folio longiore, sepalis glabris anguste ovatis acutis acuminatis, petalis ellipticis acutis, labello ovato subtrilobato, lobo antico oblongo apice rotundo, lobis lateralibus infra medium late rotundatis disco infra medium lamellato.

Plant medium in size, epiphytic, densely caespitose; roots slender. Sterile ramicauls erect, stout, 3-5 mm long, enclosed by 3-4 minutely ciliate, lepanthiform sheaths; inflorescence-bearing ramicauls stout, erect, 6-7 cm long, enclosed by 6-7 coarsely pubescent, lepanthiform sheaths. **Leaf** of sterile ramicaul erect, thickly coriaceous, narrowly elliptical, acute, 20-25 mm long, 3-4 mm wide; leaf of inflorescence-bearing ramicaul erect, thickly coriaceous, narrowly elliptical, acute, 12-15 mm long, 3 mm wide, contracted below into a petiole 1-2 mm long. **Inflorescence** 1 or 2 simultaneous, secund, several-flowered racemes 3-3.5 cm long including the peduncle less than 0.5 cm long, from near the apex of an inflorescence-bearing ramicaul; floral bracts 4 mm long; pedicels 1.5 mm long; ovary 0.75 mm long; **sepals** white, glabrous, fleshy, subcarinate, the dorsal sepal ovate, acute, acuminate, concave, 8 mm long, 2.5 mm wide, 3-veined, connate to the lateral sepals for 0.5 mm, the lateral sepals narrowly triangular, oblique, 8 mm long, 1 mm wide, connate 1.5 mm, each 1-veined; **petals** white with purple midvein, elliptical, oblique, acute, 4.5 mm long, 1.4 mm wide; **lip** white with the center purple, ovate, subtrilobed, 4.5 mm long, 2 mm wide across the lobes, the apical portion oblong with the apex rounded, the lateral lobes low, broadly rounded, below the middle, the disc with a tall, narrow lamella on the lower fourth above the base, the base narrowly truncate, hinged to the column-foot; **column** terete, 1.5 mm long, the anther subapical, the stigma ventral.

ECUADOR: Prov. of Loja: epiphytic in cloud forest above Jimbura, alt. 3350 m, 22 Mar. 1984, *C. Luer, A. Hirtz, S. Dalström, T. Hõijer & J. Kuijt 9639* (Holotype: MO).

This species from southernmost Ecuador produces two different vegetative forms. Species with two different vegetative forms are also seen in a few species of other pleurothallids, such as *Lepanthes* and *Pleurothallis*.

Short, lepanthiform sheathed ramicauls bearing much longer, thick, narrowly elliptical leaves form dense, caespitose plants. From within the clump an occasional, stout ramicaul with coarsely pubescent, lepanthiform sheaths rises several times higher than the other leaves with the short ramicauls. At the apex, a leaf only half the size of the leaves below is produced. It is from these tall ramicauls from which the inflorescences are borne.

The flowers are not unusual for the subgenus *Tubella*. The ovate lip possesses a tall, longitudinal lamella above the base.

Trichosalpinx montana (Barb.Rodr.) Luer, Phytologia 54: 396, 1983. Fig. 61.

Bas.: *Lepanthes montana* Barb.Rodr., Gen. Sp. Orchid. Nov. 1: 22, 1877.
Ety.: From the Latin *montanus*, "montane," referring to the habitat.

Syn.: *Pleurothallis collina* Cogn., Fl. Bras. 3(4): 582, 1896, not *P. montana* Barb.Rodr.
Ety.: From the Latin *collinus*, "of the hills," referring to the habitat.

Syn.: *Pleurothallis collina* var. minor Cogn., Fl. Bras. 3(4): 583, 1896.

Syn.: *Lepanthes quartzicola* Barb.Rodr., Vellosia 1, ed. 2: 119, 1891.
Ety.: From the Latin *quartzicola*, "dwelling upon quartz," referring to the habitat.

Syn.: *Pleurothallis quartzicola* (Barb.Rodr.) Cogn., Fl. Bras 3(4): 581, 1896.

Syn.: *Pleurothallis lepanthipoda* Hoehne & Schltr., Arch. Bot. São Paulo 1: 218, 1926.
Ety.: From the Greek *lepanthipodos*, "with the base of a *Lepanthes*," referring to the ramicaul.

Syn.: *Trichosalpinx quartzicola* (Barb.Rodr.) Luer, Phytologia 54: 397, 1983.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 3-9 cm long, enclosed by 4-9 dark, closely appressed, lepanthiform sheaths with thick, ciliate ostia. **Leaf** erect, coriaceous, narrowly elliptical, acute, 2-5 cm long, 0.8-1.2 cm wide, cuneate below into a petiole 0.5 cm long. **Inflorescence** a loose, flexuous, flexible, successively several-flowered raceme, up to 20 cm long, including the filiform peduncle 3-5 cm long, 2 flowers frequently open simultaneously, from near the apex of the ramicaul; floral bracts 2-3 mm long; pedicels 2-4 mm long; ovary 1.25 mm long; **sepals** yellow, more or less suffused with purple along the veins, glabrous, carinate, the dorsal sepal ovate, acute, long-acuminate, 10-16 mm long, 3-4 mm wide, 3-veined, the lateral sepals variously connate into an ovate, bifid lamina, 10-16 mm long, 3-5 mm wide, 4-veined, the apices acute, long-acuminate, approximate; **petals** elliptical-obovate, 2.75-3.5 mm long, 1.6-2.5 mm wide, 1-veined, the apex obtuse with the margins more or less irregular or subapiculate; **lip** yellow, oblong-trilobed, arcuate, 3.5-5 mm long, 2-2.75 mm wide, apical 2 thirds ovate, obtuse, the basal lobes erect, uncinate, the disc with a pair of low, thick calli from the bases of the lobes extending to about the middle, the base truncate, hinged to the column-foot; **column** terete, 1.5-2 mm long, the anther subapical, the stigma ventral, the foot thick, 1 mm long.

BRAZIL: Edo. Minas Gerais: epiphytic near Capivary, *B. Rodrigues s.n.* (Holotype:); lithophytic in forest, Serra de San José d'El-Rei, *B. Rodrigues s.n.* (holotype of *L. quartzicola*: ?RB). Edo. Rio de Janeiro: Rio Paquequer, near Theresopolis, 18 June 1887, *J. T. Moura 7* (holotype of var. *minor*: BR); near Petropolis, alt. ca. 1000 m, flowered in cultivation by Verboonen at Orquideario Binot, 30 Nov. 1989, *C. Luer 14530B* (MO). Edo. Santa Catarina: Palhora, 20 Mar. 1951, *P. Rohr s.n.* (AMES). Edo. São Paulo: Alto da Serra, 21 Apr. 1920, *F. C. Hoehne 3905* (lectotype of *P. lepanthipoda*: SP; isolectotype: AMES); collected near São Paulo by R. L. Stone, cultivated in Los Altos Hills, CA, 14 Dec. 1978, *C. Luer 3640* (SEL). Edo Pernambuco: Cha Grande, collected by A. B. Gomes-Ferreira, 15 June 1983, cultivated at the São Paulo Botanical Garden, 13418, 23 May 1986, *C. Luer 11610A* (MO).

This species is widely distributed and relatively frequent in southeastern Brazil. It is closely related to *T. dirhamphis* which is widely distributed in the Andes. *Trichosalpinx montana* is distinguished by narrowly elliptical leaves that are far

exceeded by a lax, flexible, arching, successively flowered raceme (simultaneously flowered in *T. dirhamphis*); and long-acuminate sepals with the laterals connate to about the middle into an ovate blade (the lateral sepals of *T. dirhamphis* are free and spreading). The petals are obtuse with the apical margin more or less irregular. The variations of the lips of the two species are the same. They are distinctive with an erect pair of uncinate basal lobes.

Trichosalpinx multicuspidata (Rchb. f.) Luer, Phytologia 54: 396, 1983. Fig. 62.

Bas.: *Pleurothallis multicuspidata* Rchb. f., Linnaea 41: 117, 1877.

Ety.: From the Latin *multicuspidatus*, "with many teeth," possibly in reference to the appearance of the raceme with many long tails of the sepals.

Plant small to medium in size, epiphytic, caespitose; roots slender. Ramicauls erect, slender, nonprolific, 1-5 cm long, enclosed by 4-5 ciliate, lepanthiform sheaths. **Leaf** erect, thickly coriaceous, elliptical, subacute to obtuse, 12-24 mm long, 4-8 mm wide, contracted below into a petiole 1-3 mm long. **Inflorescence** a loose, distichous, flexuous, simultaneously several-flowered raceme 5-7 cm long including the peduncle 1.5-2 cm long, from near the apex of a ramicaul; floral bracts 1.5-2 mm long; pedicels 5-8 mm long; ovary 0.75 mm long; **sepals** yellow, glabrous, subcarinate, the dorsal sepal ovate, acute, long acuminate, concave below, 12-18 mm long including the filiform tail, 2.5-3 mm wide, 3-veined, connate to the lateral sepals for 0.5 mm, the lateral sepals narrowly oblong-triangular, oblique, acute, long-acuminate, 12-17 mm long including the filiform tail, 0.75 mm wide, connate 2 mm, each 1-veined; **petals** membranous, elliptical, oblique, acute, 3.5 mm long, 1.5 mm wide, 1-veined; **lip** yellow, trilobed, 3.2-4 mm long, 1.6-2 mm wide across the lobes, the apical half oblong with the apex rounded, the basal half with lateral lobes erect, obliquely rounded with antrorse, obtuse apices at the middle, the disc featureless, the base narrowly truncate, hinged to the column-foot; **column** terete, 2 mm long, the anther subapical, the stigma ventral.

COLOMBIA: Dept. of Antioquia: Sonsón, *G. Wallis s.n.* (Holotype: W; isotype: AMES). Dept. of Boyacá: Sierra Nevada del Cocuy, alt. 2900-3100 m, 15-16 Aug. 1957, *P. J. Grubb & B. Curry 514, 525* (K, US), C. Luer illustr. 9141. Dept. of Cundinamarca: Páramo de Zipaquirá, alt. 3200 m, 6 Aug. 1949, *M. Schneider 510a* (S); Páramo de La Siberia, alt. 3350 m, 23 Aug. 1953, *M. Schneider 510b* (S); cloud forest above Gutiérrez south of Bogotá, alt. 2850 m, 19 May 1984, *C. Luer, J. Luer & R. Escobar 10387* (MO). Dept. of Tolima: west slopes of Alto de Osevas, alt. 2800-3200 m, 11 Jan. 1883, *F. C. Lehmann 2386* (K). Dept. of Nariño: Páramo del Tabano, Andes Orient., Pasto, 4 May 1876, *E. André 3009* (K). Without locality, páramo, alt. 2000 m, *G. Wallis 335* (W).
VENEZUELA: Edo. Sucre: Peninsula de Paria, alt. 1000 m, 1 Mar. 1966, *J. A. Steyermark 94805* (AMES). Edo. Táchira: Páramo de Tamá, alt. 2500-2800 m, 15 July 1944, *J. A. Steyermark 57293, 57356, 57394* (AMES). Without locality, Apr. 1968, *G. C. K. Dunsterville 1072*.
ECUADOR: Prov. of Zamora-Chinchipe: "Loja." *Hübsch s.n.* (W); epiphytic in cloud forest above Valladolid, alt. 2450 m, 23 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10922* (MO).

This species, infrequent but widely distributed from coastal Venezuela and the Eastern Cordillera of Colombia to southern Ecuador, is distinguished by the medium-sized habit of densely caespitose, nonproliferating ramicauls with loose, several-flowered racemes of comparatively large flowers with long, filiform sepaline tails. The lateral sepals are very narrow, and the petals are acute. The lip is three-lobed with the erect, lateral lobes terminating at the middle with obtuse apices. No calli are present.

Trichosalpinx nana (Ames & C.Schweinf.) Luer, Phytologia 54: 396, 1983. Fig. 63.

Ety.: From the Latin *nanus*, "dwarf," referring to the small habit.

Syn.: *Pleurothallis nana* Ames & C.Schweinf., Sched. Orchid. 8: 29, 1925.

Plant very small, epiphytic, scandent, prolific, branching, erect to suberect, up to 20 cm or more long; roots slender at the base. Ramicauls ascending, slender, producing another ramical from the apex, 1-3 cm long, enclosed by 3-6 minutely ciliate, lepanthiform sheaths. **Leaf** ascending, coriaceous, elliptical, obtuse, 6-9 mm long including a petiole 1 mm long, 3-6 mm wide, cuneate below into the petiole. **Inflorescence** a loose, flexuous, distichous, simultaneously several-flowered raceme ca. 3 cm long including the filiform peduncle 1-1.5 cm long, from near the apex of a ramicaul; floral bracts 1 mm long; pedicels 2.5-3 mm long; ovary 0.25 mm long; **sepals** translucent white, glabrous, carinate, narrowly triangular, acute, the dorsal sepal concave below the middle, 3-3.5 mm long, 1.5 mm wide, 1-veined, free from the lateral sepals, the lateral sepals 3 mm long, 1 mm wide at the base, 1-veined, connate 0.25 mm; **petals** membranous, elliptical, oblique, acute, 1 mm long, 0.25 mm wide, 1-veined; **lip** oblong-trilobed, 1-1.5 mm long, 0.5 mm wide across the lobes expanded, the apical lobe oblong with the apex rounded, the lateral lobes erect, oblique, broadly rounded, below the middle, with the anterior margins of the lobes slightly thickened without forming a callus, the base truncate, hinged to the column-foot; **column** terete, 1 mm long, the foot 0.25 mm long, the anther and the stigma ventral.

COSTA RICA: Prov. of Cartago: Pejivalle, 16 May 1924, *C. H. Lankester 865* (Holotype: AMES). Prov. of Heredia: "saddle between Poás and Barba," 12 May 1963, *C. H. Lankester s.n.* (MO, SEL), C. Luer illustr. 17496.

This very rare, tiny, creeping species is extremely similar to the Andean *T. scabridula*, differing mostly in the much smaller flowers. The calli at the forward angle between the lateral lobes and the anterior lobe of the lip are barely discernible.

Trichosalpinx notosibirica (Hashimoto) Luer, Phytologia 54: 396, 1983. Fig. 64., 65.

Bas.: *Pleurothallis notosibirica* Hashimoto, Bull. Nalt. Sci. Mus. 4: 11, 1978.

Ety.: From the Greek noto-, "southern," referring to the Bolivian Siberia where the species was discovered, as opposed to Asiatic Siberia.

Syn.: *Pleurothallis mastophora* Luer & Vásquez, Phytologia 49: 209, 1981.

Ety.: From the Greek *mastophoros*, "breast-bearing," in allusion to the calli of the lip.

Syn.: *Trichosalpinx mastophora* (Luer & Vásquez) Luer, Phytologia 54: 396, 1983.

Plant small to large, epiphytic, scandent, up to 30 cm long; roots slender. Ramicauls prolific, branching, up to 20 cm long below, 2-4 cm long above, enclosed by 2-7 closely appressed, ciliate, lepanthiform sheaths with dilated ostia. **Leaf** suberect, coriaceous, more or less suffused with purple, elliptical, subacute to obtuse, 1-5 cm long including the petiole 1-7 mm long, 4-18 mm wide, cuneate below into the petiole. **Inflorescence** a loose, lightly flexuous, more or less simultaneously several-flowered raceme, 5-12 cm long including the filiform peduncle 2-4 cm long, from near the apex of the ramicaul; floral bracts 1-1.5 mm long; pedicels 6-11 mm long; ovary 0.75-1 mm long; **sepals** translucent pale yellow, more or less suffused with purple along the veins, glabrous, subcarinate, the dorsal sepal ovate in the lower third, concave, acute, acuminate, 10-20 mm long, 2-3.5 mm wide, 3-veined, free from the lateral sepals, the lateral sepals spreading, narrowly linear-triangular, acute, attenuate, 10-20 mm long, 1-1.5 mm wide, 1-veined, barely connate at the base; **petals** translucent, elliptical, oblique, subacute, 2-3 mm long, 1-1.5 mm wide, 1-veined; **lip** light yellow, ovate-trilobed, 3-4 mm long, 1 mm wide, 2 mm wide across the expanded lobes, the apical lobe oblong, obtuse to rounded at the apex, with the lateral lobes on the lower third, erect, antrorse, obtuse to rounded, the disc with an obtuse, conical callus at the forward angle of each lateral lobe, the base subunguiculate, hinged to the column-foot; **column** terete, 1.5-2 mm long, the anther subapical, the stigma ventral.

BOLIVIA: Dept. of Santa Cruz: 30 km west of Comarapa, alt. 2600 m, 11 Dec. 1974, *Nishida, Ono, Hashimoto & Ohga 01077* (Holotype: TNS). Dept. of Cochabamba: Chapare, NE of Cochabamba toward Villa Tunari, alt. 1950 m, 26 Nov. 1978, *C. Luer, J. Luer, F. Fuchs et al. 3504* (SEL); same area, alt. 2500 m, 4 Feb. 1983. *C. Luer, J. Luer & R. Vásquez 8687* (SEL); same area, alt. 1850 m, 17 Jan. 1984, *C. Luer, J. Luer & R. Vásquez 9378* (SEL); same area, alt. 1900 m, 15 Jan. 1988, *C. Luer, J. Luer, R. Vásquez et al. 12832* (MO); Chapare, epiphytic in cloud forest northeast of Cochabamba, alt. 2840 m, 16 Jan. 1981, *C. Luer, J. Luer & R. Vásquez 5645* (holotype of *P. mastophora*: SEL); same area, 25 Feb. 1978, *R. Vásquez 11* (SEL); old, abandoned road from Cochabamba to Villa Tunari, alt. 3150 m, 1 Feb. 1997, *C. Luer, J. Luer, R. Vásquez, D. Ric & W. Teague 18366* (MO): same area, alt. 3100 m, 1 Feb. 1997, *C. Luer, J. Luer, R. Vásquez, D. Ric & W. Teague 18366A* (MO). same area, alt. 2500 m, 2 Feb. 1997, *C. Luer, J. Luer, R. Vásquez, D. Ric & W. Teague 18375* (MO). Dept. of La Paz: Sud Yungas, epiphytic in cloud forest above Río Unduavi, alt. 2450 m, 6 Feb. 1980, *C. Luer, J. Luer, R. Vásquez & M. Manon 5156* (SEL).

PERU: not yet identified from Peru.

ECUADOR: Prov. of Loja: south of Yangana north of the pass, alt. 2400 m, 23 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10889* (MO). Prov. of Zamora-Chinchipe: east of the pass east of Loja, alt. 2500 m, 21 Jan. 1992, *C. Luer, J. Luer, P. Jesup, A. Jesup & A. Hirtz 16084* (MO).

This species is common on much of the northern slopes of the Andes of Bolivia at high altitudes, with an extension of the range into southern Ecuador. No specimen has yet been identified from intervening Peru. It was first identified as *Pleurothallis notosibirica* in Bolivia by a team of Japanese botanists.

Trichosalpinx notosibirica is distinguished by the elongating branches of superposed ramicauls that are exceeded by the long-pedicellate inflorescences of slender, long-tailed flowers. The elliptical leaves at intervals along the stem are exceedingly variable in size, varying from barely one centimeter to five centimeters long. A plant of the latter with proportionately larger flowers was described as *P. mastophora* (Fig. 65.). The lips with lobes below the middle with a pair of mammillate calli are similar to those *T. intricata* and *T. scabridula*.

Trichosalpinx nymphalis (Luer) Luer, Phytologia 54: 396, 1983. Fig. 66.

Bas.: *Pleurothallis nymphalis* Luer, Phytologia 49: 212, 1981.

Ety.: From the Latin *nymphalis*, "like a nymph," in allusion to the habit of mossy trunks of trees of the cloud forest.

Plant very small, epiphytic, caespitose; roots slender. Ramicauls suberect, 4-6 mm long, enclosed by 2-3 minutely ciliate, lepanthiform sheaths. **Leaf** spreading, thickly coriaceous, broadly elliptical to suborbicular, obtuse, 5-7 mm long, 4.5-5 mm wide, contracted below into a petiole 0.5 mm long. **Inflorescence** a proportionately large flower borne singly or in a distantly 2-flowered raceme, 10-17 mm long including the filiform peduncle, from near the apex of the ramicaul; floral bracts 0.75 mm long; pedicels 4 mm long; ovary 0.5 mm long; **sepals** transparent rose, glabrous, carinate, the dorsal sepal ovate, concave, the blade 7 mm long, 4 mm wide expanded, 3-veined, the subacute apex contracted into a filiform tail 4 mm long, the lateral sepals connate 4 mm into a bifid lamina 7 mm long, 3 mm wide, each 1-veined, the acute apices terminating in filiform tails 4 mm long; **petals** translucent yellow, obovate, oblique, obtuse, 3.5 mm long, 1.8 mm wide, 1-veined; **lip** yellow, ovate-trilobed, 4.25 mm long, 1.75 mm wide, the apical lobe triangular, acute, the lateral lobes below the middle, erect, rounded, oblique, antrorse, the disc thickened, narrowly subtruncate, hinged to the column-foot; **column** slender, terete, 2.5 mm long, the anther subapical, the stigma ventral.

ECUADOR: Prov. of Loja: epiphytic in cloud forest south of Yangana, alt. 2450 m, 12 May 1981, *C. Luer, J. Luer, et al. 6197* (Holotype: SEL).

This little species is known from only one forested area in southern Ecuador. It is distinguished by the tiny tuft of thick, broadly elliptical leaves that obscure the short ramicauls. Only with a hand lens are the lepanthiform sheaths evident. A flower, comparatively large for the size of the plant, is borne singly above the leaves. Sometimes it is followed by a second flower. The large dorsal sepal is deeply concave with a short, filiform tail. The apices of the bifid synsepal are terminated by similar tails. The lip is three-lobed with the anterior lobe acute.

Trichosalpinx otarion (Luer) Luer, Phytologia 54: 396, 1983. Fig. 67.

Bas.: *Pleurothallis otarion* Luer, Selbyana 7: 120, 1982.

Ety.: From the Greek *otarion*, "a little ear," referring to the basal lobes of the lip.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls erect, relatively stout to slender, 3.5-12 mm long, enclosed by 5-7 closely appressed, dark brown, lepanthiform sheaths with hispidulous ostia. **Leaf** erect, thickly coriaceous, elliptical, acute, 2.5-5 cm long including a petiole 3-7 mm long, 6-10 mm wide, cuneate below into the petiole. **Inflorescence** a solitary (occasionally 2), dense, strict, secund, simultaneously many-flowered raceme 6-13 cm long including the peduncle 4-5 cm long, from near the apex of the ramicaul; floral bracts 2 mm long; pedicels 0.75-1 mm long; ovary 0.5 mm long; **sepals** yellow-white, glabrous, carinate, free, the dorsal sepal narrowly ovate, acute, long-

attenuate, 10 mm long, 1.5 mm wide, 3-veined, the lateral sepals narrowly ovate, oblique, acute, long-attenuate, 9.5 mm long, 1.3 mm wide, each 1-veined; **petals** elliptical-ovate, acute, 2.5 mm long, 1.25 mm wide, 1-veined; **lip** yellow, deeply trilobed, 1.75 mm long, 1.75 mm wide across the expanded lobes, the anterior lobe narrowly oblong, obtuse, the lateral lobes basal, auriculate, incurved, transversely obtuse, cellular-pubescent, the disc shallowly concave above the base, the base truncate, hinged to the column-foot; **column** terete, stout, 0.75 mm long, with an obsolescent foot, the anther subapical, the stigma ventral.

ECUADOR: Prov. of Loja: epiphytic in cloud forest east of Yangana, alt. 2650 m, 4 March 1982, *C. Luer, S. Dalström, A. Andreetta & D. D'Alessandro 7142* (Holotype: SEL).
PERU: Dept. of San Martín: Huallaga, valley of Río Apisoncho, alt. 3600 m, 23 Aug. 1965, *A. C. Hamilton & P. M. Holligan 1280* (K).

This species is apparently rare, having been found but once in southeastern Ecuador and once in central Peru. It is characterized by the relatively large, elliptical leaf surpassed by a long, crowded, strict, secund raceme of many simultaneous flowers. The sepals are long-attenuate, the petals are acute, and the lip is deeply three-lobed. The lobes are basal, auriculate and minutely pubescent.

Trichosalpinx parsonsii Luer & Dod, sp. nov. Fig. 68.

Ety.: Named in honor of Jerry Parsons of Berkeley, CA, co-collector of this species.

Species haec *T. durae* (Lindl.) Luer affinis, sed floribus minoribus, sepalis angustioribus et labello oblongo ecalloso distinguitur.

Plant small, epiphytic, scandent, prolific, up to 10 cm or more long; roots slender along the stem. Ramicauls ascending, slender, producing another ramical from the apex, 10-12 mm long, enclosed by 3-4 minutely ciliate, lepanthiform sheaths. **Leaf** ascending, thickly coriaceous, elliptical, obtuse, 8-10 mm long, 4.5-6 mm wide, broadly cuneate or rounded below into a petiole ca. 1 mm long. **Inflorescence** a loose, subflexuous, distichous, simultaneously few-flowered raceme 2-3 cm long including the filiform peduncle ca. 1 cm long, from near the apex of a ramicaul; floral bracts 1 mm long; pedicels 2 mm long; ovary 0.5 mm long; **sepals** pale yellow, glabrous, subcarinate, the dorsal sepal narrowly ovate-triangular and concave below the middle, acute, attenuate above the middle, 4 mm long, 1 mm wide, 3-veined, barely connate to the lateral sepals, the lateral sepals free, narrowly triangular, attenuate, acute, oblique, 4 mm long, 0.75 mm wide, 1-veined; **petals** membranous, elliptical, oblique, obtuse, microscopically irregular at the tip, 1.5 mm long, 0.8 mm wide, 1-veined; **lip** yellowish, oblong, very shallowly concave, 1.5 mm long, 0.5 mm wide, with the apex rounded and thickened, the base truncate, hinged to the column-foot; **column** terete, 0.6 mm long, wingless, the foot minute, 0.2 mm long, the anther subapical, the stigma ventral.

COSTA RICA: Prov. of San José: near Santa Maria de Dota, 13 June 1990, flowered in cultivation in Berkeley, CA, by D. Dod, June, 1997, *M. Grantham & J. Parsons 03 93 90* (Holotype: UC; Isotype: MO), C. Luer illustr. 18486.

This little species with small prolific ramicauls and small elliptical leaves is vegetatively similar to sympatric forms of the *T. dura*-complex and the Andean *T. scabridula*. Loose racemes of tiny, yellow flowers exceed the leaves. From both the above, *T. parsonsii* differs with the smaller flowers with proportionately narrower sepals and a simple, oblong lip free of any callus.

Trichosalpinx pergrata (Ames) Luer, Phytologia 54: 396, 1983. Fig. 69., 70.

Bas.: *Pleurothallis pergrata* Ames, Sched. Orchid. 4: 24, 1923.

Ety.: From the Latin *pergratus*, "very pleasing," in allusion to the appearance of the plant.

Syn.: *Pleurothallis falcipetala* Schltr., Repert. Spec. Nov. Regni Veg. Beih. 27: 163, 1924.

Ety.: From the Latin *falcipetalus*, "with falcate petals," referring to the petals.

Syn.: *Trichosalpinx falcipetala* (Schltr.) Luer, Phytologia 54: 395, 1983.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 1-6 cm long, enclosed by 4-7 ciliate, lepanthiform sheaths. **Leaf** erect, coriaceous, elliptical, subacute to obtuse, 10-23 mm long, 4-9 mm wide, contracted below into a petiole 2-3 mm long. **Inflorescence** a fascicle of successive,

single-flowered peduncles, peduncle 3-5 mm long, from near the apex of a ramicaul; floral bracts 1-1.75 mm long; pedicels 1-1.5 mm long; ovary 0.75 mm long; **sepals** yellow or purple, glabrous, subcarinate, the dorsal sepal ovate, acute, acuminate, concave below, 5-23 mm long including the filiform tail, 2-3 mm wide expanded, 3-veined, free from the lateral sepals, the lateral sepals narrowly ovate-triangular, oblique, acute, acuminate, 5-22 mm long including the filiform tail, 1-2 mm wide, connate 0.5-4 mm, each 1-veined; **petals** yellow or purple, membranous, elliptical-obovate, oblique, obtuse, 2-4 mm long, 1.25-1.5 mm wide, 1-veined, more or less microscopically denticulate; **lip** yellow or purple, ovate, obscurely trilobed, 2-4.5 mm long, 1.25-2 mm wide across the lobes, the apical half oblong with the apex rounded, the basal half with low, broadly rounded, lateral lobes, the disc featureless, the base subunguiculate, narrowly truncate, hinged to the column-foot; **column** terete, 1.75-3 mm long, the anther subapical, the stigma ventral, the foot 0.5 mm long.

COSTA RICA: Prov. of Cartago: La Estrella de Cartago, alt. ca. 5000 ft., *C. H. Lankester & A. Sancho 436* (Holotype: AMES).
PANAMA: Prov. of Chiriquí: Fortuna, Mar. 1985, *A. Maduro 1-M* (MO); Cerro Punta, 1986, *A. Maduro s.n.* (MO). Prov. of Coclé: epiphytic above El Valle, alt. ca. 1000 m, 1976, *C. Luer 192* (SEL).
COLOMBIA: Dept. of Antioquia: Corconá, El Biaho, alt. 1800-2100 m, collected and cultivated by Padre Sergio, 22 July 1978, *C. Luer 2951* (SEL); Yarumal, El Oro, alt. 2700 m, 1 May 1984, *C. Luer, J. Luer & R. Escobar 10080* (MO); Urrao, Llavero, collected by Lucho, May 1982, flowered in cultivation at Colomborquídeas, May 1993, *C. Luer 16916* (MO). Dept. of Cauca: without locality, *F. C. Lehmann 2045* (holotype of *P. falcipetala* presumably destroyed at B, neotype here designated): old dept. of Cauca: Cali, *F. C. Lehmann 8245* (neotype of *T. falcipetala*: K), C. Luer illustr. 16403. Dept. of Valle del Cauca: Lago Calima, alt. 1800 m, 1989, cultivated by Colomborquídeas, 6 July 1996, *R. Escobar & E. Valencia 4012* (MO), C. Luer illustr. 17974.

This small species is known from Central America, where it was described from a Costa Rican collection by Lankester, and the Western Cordillera of Colombia, where it was described later from a much earlier collection by Lehmann. It is one of the very few species of the genus characterized by single flowers borne by short peduncles. The flowers are variable in size, and the apices of the sepals are variable in length. A variation with particularly short-tailed sepals, or with sepals merely acute, is known from the southernmost part of the distribution in the Cauca Valley. Variations from Central America and Antioquia in Colombia often bear long-tailed sepals four times as long.

Although Schlechter's description of Lehmann's collection from Cauca varies from plants collected there today, I have little doubt that they are the same species. Small flowers not well preserved can be difficult to interpret after rehydration.

Trichosalpinx pumila (Luer) Luer, Phytologia 54: 397, 1983. Fig. 71.

Bas.: *Pleurothallis pumila* Luer, Selbyana 1: 268, 1975.

Ety.: From the Latin *pumilus*, "dwarf," referring to the habit of the plant.

Plant very small, epiphytic, caespitose; roots slender. Ramicauls erect, 2-3 mm long, enclosed by 2 ribbed but glabrous sheaths. **Leaf** erect, coriaceous, broadly elliptical to suborbicular, margined, obtuse, 6-13 mm long, 3-7 mm wide, contracted below into a petiole 1 mm long. **Inflorescence** a loose, successively few-flowered raceme, 5-10 cm long, including the filiform peduncle 2-3 cm long, from near the apex of the ramicaul; floral bracts 1-1.5 mm long; pedicels 1 mm long; ovary 0.5 mm long; **sepals** translucent yellow, glabrous, subcarinate, the dorsal sepal ovate, concave, acute, slightly acuminate, 5-6 mm long, 3.5 mm wide expanded, 3-veined, the lateral sepals narrowly linear, acute, 5.5-6 mm long, connate 1.5 mm, 1-1.5 mm wide together, each 1-veined; **petals** translucent yellow, obovate, obtuse, 1.5-2 mm long, 0.75-1 mm wide, 1-veined; **lip** yellow, ovate-trilobed, 3 mm long, 1.5 mm wide across the lobes, the anterior lobe oblong with the apex rounded, the lateral lobes below the middle, erect, obtuse, the disc with a pair of erect, longitudinal lamellae from the base to the middle, the base truncate, hinged to the column-foot; **column** terete, 1.5 mm long, the anther subapical, the stigma ventral.

ECUADOR: Prov. of Pastaza: epiphytic in tall forest east to Puyo, alt. 1000 m, 29 July 1975, *C. Luer, G. Luer & S. Wilhelm 483* (Holotype: SEL); near Mera, alt. 1100 m, 2 Feb. 1956, *E. Asplund 19181* (S); near Mera, alt. 1100 m, 23 Feb. 1972, *G. Harling 11010* (GB). Prov. of Loja: Nudo de Sabanilla, above Yangana, alt. 2300-2500 m, 2 Apr. 1985, *G. Harling & L. Andersson 23537* (GB). Prov. of Zamora-Chinchipe: epiphytic in cloud forest south of Yangana, alt. 2250 m, 11 May 1981, *C. Luer, J. Luer, D. D'Alessandro et al. 6142* (SEL).

This little species from the eastern declivities of the Ecuadorian Andes is vegetatively similar to two other sympatric species of the genus: *T. nymphalis* and *T. systremmata*. All three are characterized by small, ovate to rounded leaves borne by very short ramicauls with ribbed sheaths that are nearly devoid of cilia or scabrosities. They seem to form a connecting link between *Pleurothallis* and *Trichosalpinx*. The basic morphology of the floral parts, especially the column, indicate their close relationship to *Trichosalpinx*. The flowers are borne by capillary peduncles that far surpass the clump of little leaves.

Trichosalpinx pumila is distinguished from the other two species by the pair of tall lamellae on the disc of the lip. Only the much larger *T. tenuis* with a well-developed ramicaul possesses a similar cleft callus.

Trichosalpinx pusilla (H.B.K.) Luer, Phytologia 54: 397, 1983. Fig. 72.

Bas.: *Dendrobium pusillum* H.B.K., Gen. Sp. Pl. 1: 357, 1816.

Ety.: From the Latin *pusillus*, "very small," referring to the habit.

Syn.: *Specklinia pusilla* (H.B.K.) Lindl., Edwards' Bot. Reg. 21: sub t. 1797, 1836.

Syn.: *Pleurothallis pusilla* (H.B.K.) Lindl., Edwards' Bot. Reg. 28: misc. 82, 1842.

Syn.: *Humboldtia pusilla* (H.B.K.) Kuntze, Rev. Gen. Pl. 2: 668, 1891.

Syn.: *Pleurothallis roraimensis* Rolfe, Trans. Linn. Soc. London, Bot. ser. 2, 6: 58, 1901.

Ety.: Named for Mt. Roraima where the species was collected.

Syn.: *Trichosalpinx roraimensis* (Rolfe) Luer, Phytologia 54: 397, 1983.

Plant very small, epiphytic, caespitose; roots slender. Ramicauls erect, occasionally prolific, slender, 3-10 mm long, enclosed by 2-4 microscopically ciliate, lepanthiform sheaths. **Leaf** erect, thickly coriaceous with convex surfaces, broadly elliptical to orbicular, obtuse, 3-8 mm long, 3-5 mm wide, broadly cuneate below into a petiole 1 mm long. **Inflorescence** a loose, 2- to 3-flowered raceme 10-25 mm long including the filiform peduncle 10-15 mm long, from near the apex of a ramicaul; floral bracts 0.5-1 mm long; pedicels 1.5-3 mm long; ovary 0.5 mm long, commonly swollen into a capsule; **sepals** yellow to purple, glabrous, subcarinate, the dorsal sepal ovate, concave, acute, slightly acuminate, 4 mm long, 1.5-2 mm wide, 3-veined, barely connate to the lateral sepals, the lateral sepals narrowly triangular, oblique, acute, 3.75-4 mm long, 0.75 mm wide, each 1-veined, connate 1 mm; **petals** translucent, elliptical, subacute to obtuse, 1.5-2 mm long, 0.75-1 mm wide, 1-veined; **lip** yellowish, ovate-trilobed, 2-2.4 mm long, 1.25-1.5 mm wide across the lobes, the apical lobe oblong with the apex rounded and thickened, the lateral lobes in the lower third, low, erect, rounded to obtuse and slightly antrorse, the disc with a low, rounded callus at the forward angles of the lobes, the base unguiculate-truncate, hinged to the column-foot; **column** semiterete, 1 mm long, the foot short, the anther and the stigma ventral.

ECUADOR: Prov. of Loja: in small trees near Loja, 1802, *A. Humboldt & A. Bonpland s.n.* (Holotype: P; Isotypes: AMES, W), C. Luer illustr. 17189; Horta-Naque, alt. 3500 m, 9 Nov. 1946, *R. Espinosa 987* (AMES, LOJA); at the pass north of Loja, alt. 9100 ft., collected Nov. 1988, flowered in cultivation at J & L Orchids, Easton CT, *C. Head 1288-606* (MO); south of Yangana, alt. 2400 m, 23 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10873* (MO). Prov. of Napo: north of Baeza, alt. 1650 m, 30 Oct. 1979, *C. Luer, J. Luer & A. Hirtz 4483* (SEL). Prov. of Morona-Santiago: north of Gualaquiza, alt. 1600 m, 17 May 1988, *C. Luer, A. Hirtz, W. Flores, A. Andreetta & W. Teague 13425* (SEL). Prov. of Sucumbíos: south of Sta. Barbara, alt. 2600 m, 5 Apr. 1984, *C. Luer, S. Dalström & T. Höijer 9972* (MO). Prov. of Zamora-Chinchipe: cloud forest south of the pass south of Jimbura, alt. 3050 m, 21 Feb. 1986, *C. Luer, J. Luer, A. Hirtz, W. Flores & A. Embree 12001* (MO).

COLOMBIA: Dept. of Antioquia: El Retiro, above Colomborquídeas, flowered in cultivation, 16 May 1993, *C. Luer 16915* (MO); El Carmen, above San Lorenzo, alt. 2500 m, 21 Mar. 1989, *C. Luer, J. Luer & W. Teague 14347* (MO). Dept. of Cundinamarca: Zipaquirá, alt. 2900 m, 15 July 1942, *S. A. Camargo & S. Huertas s.n.* (AMES). Dept. of Norte de Santander: cloud forest, Alto de San Francisco, alt. 2600 m, 11 May 1984, *C. Luer, J. Luer, R. Escobar & E. Valencia 10253* (MO); cloud forest, Alto de Mefue, alt. 2600 m, 12 May 1984, *C. Luer, J. Luer, R. Escobar & E. Valencia 10294* (MO).

VENEZUELA: Edo. Mérida: La Montaña Teleférico Station, alt. 2450-2650 m, Jan. 1990, *M. S. Skefington & N. E. Scott 12a* (K); same area, 18 Aug. 1995, *D. Kelly et al. 10576* (K, MO, TCD). Edo. Táchira: Páramo de Tamá, alt. 3000-3200 m, 20 May 1967, *J. A. Steyermark & G. C. K. Dunsterville 98734* (AMES). Terr. Fed. Amazonas: Atabapo, Cerro Marahuaca-huha, alt. 2580 m, 31 Jan. 1982, *J. A. Steyermark et al. 125906* (AMES, K, MO, NY, VEN); Atabapo, Cerro Marahuaca, alt. 2500 m, 16 Feb.

1981, *J. A. Steyermark, C. Brewer-Carías & R. Liesner 124378* (MO, VEN); same area, alt. 2560 m, 10-12 Oct. 1983, *J. A. Steyermark 129436, 129523, 129563, 129652* (MO, VEN); same area, alt. 2600 m, 26-27 Feb. 1985, *J. A. Steyermark & B. Holst 130816* (MO, VEN); Atabapo, Cerro Marahuaca, alt. 2660 m, 22-24 Oct. 1988, *R. Liesner 25203, 25204, 25278, 25304* (MO, VEN); Atabapo, plateau of Huachamacari, alt. 1720 m, 1 Mar. 1985, *R. Liesner 18123* (MO, VEN); below Salto Los Monos, alt. 1500-1600 m, 11 Mar. 1985, *R. Liesner 18535* (MO, VEN); same area, 20 Oct. 1988, *R. Liesner 25152* (MO, VEN); Atures, Río Coro-Coro near Yutaje, alt. 1400-1760 m, 6 Mar. 1987, *R. Liesner, B. Holst 21699* (MO, VEN). Edo. Bolívar: Ptari-tepui, alt. 2450 m, 7 Nov. 1944, *J. A. Steyermark 59945* (AMES); Cerro Guaiquinima, Río Paragua, alt. 1650 m, 31 Dec. 1951, *B. Maguire 32860* (AMES, NY); Apácara-tepui, alt. 2500 m, 19-23 June 1953, *J. A. Steyermark 75711, 75763, 75865, 75871, 75918* (AMES, F); Auyan-tepui, alt. 2050-2300 m, 15 May 1964, *J. A. Steyermark 93943* (AMES, K, NY); Torono-tepui, alt. 2000 m, 23 Feb. 1955, *J. A. Steyermark & J. J. Wurdock 1118* (AMES, NY); Meseta del Jaua, Cerro Jaua, alt. 1750 m, 22 Feb. 1974, *J. A. Steyermark et al. 109313* (AMES); Cerro Venamo, alt. 950-1000 m, 10 Jan. 1964, *J. A. Steyermark & G.C.K. Dunsterville 92937* (AMES, VEN); Cerro Roraima, near the Guayana-Brazilian border, alt. 2750-2800 m, 26 Aug. 1976, *J. A. Steyermark et al. 112595* (AMES, K, NY); Piar, Macizo del Chimantí, alt. 1920 m, 14 Feb. 1984, *J. A. Steyermark et al. 130034* (AMES, K, NY); Cerro Sipapo, alt. 1500 m, 11 Dec. 1948, *B. Maguire & L. Politi 27595* (AMES, NY); Cerro de La Neblina, Río Yatua, alt. 1700-1800 m, 6 Jan. 1954, *B. Maguire, J. J. Wurdock & G. S. Bunting 37073* (AMES, NY); Piar, summit of Tereké-Yurén, alt. 2135 m, 26 May 1986, *R. Liesner, J. Steyermark & B. Holst 21055* (MO, VEN); Piar, Camarcaibarai-tepui, alt. 1750-1800 m, 23 May 1986, *R. Liesner, J. Steyermark & B. Holst 21025* (MO, VEN); Piar, Aparaman-tepui, alt. 2100 m, 27 Mar. 1987, *B. Holst 3700* (MO, VEN); Piar, Macizo del Chimantá, Amurí-tepui, alt. ca. 1850 m, 2-5 Feb. 1983, *J. A. Steyermark, O. Huber & V. Carreño, 128571* (MO, VEN); Apacará-tepui, alt. ca. 2200 m, 30 Jan.-1 Feb. 1983, *J. A. Steyermark, O. Huber & V. Carreño, 128521* (MO, VEN); Río Tirica, alt. 2450 m, 7-9 Feb. 1983, *J. A. Steyermark, O. Huber & V. Carreño, 128928* (MO, VEN);
GUYANA: Summit of Mt. Roraima, alt. 8600 ft., 1898, *F. V. McConnell & J. J. Quelch s.n.* (holotype of *P. roraimensis*: K), C. Luer illustr. 17258.
PERU: Dept. of San Martín: Huallaga, Río Apisoncho, alt. 3600 m, 12 Aug. 1965, *A. C. Hamilton & P. M. Holligan 1262* (K).
COSTA RICA: Prov. of Puntarenas: Cordillera de Talamanca, Cerro Kamuk, Cerro Dudu, alt. 3000-3100 m, 26 Mar. 1984, *G. Davidse, G. Herrera & R. Warner 26069* (CR, MO). Prov. of Heredia: Parque Nacional Braulio Carrillo, alt. 2500 m, 11 Sept. 1990, *S. Ingram & K. Ferrell 519* (AMES, CR, F, K, MO, SEL); Volcán Barba, alt. 2500-2700 m, no date, *B. Boyle 519* (USJ).

This tiny species occurs relatively frequently, usually within moss on scrubby trees, from Mt. Roraima on the Guyana-Venezuelan border, and through the Andes into Peru, with recent collections from Costa Rica. It occurs within a vertical range between 1600 and 3000 meters above sea level, but always in areas of high rainfall and humidity. It was first described from a collection in 1802 by Humboldt and Bonpland near Loja in southeastern Ecuador, where it is still to be found today.

Typically, the minute plants are densely caespitose, but the ramicauls are occasionally shortly prolific. The inflorescence is single-flowered, to a loose, two- to three-flowered raceme that surpasses the leaves. The flowers commonly produce tiny capsules. Morphologically, the flowers vary little throughout the wide distribution. The acuminate sepals are usually about four millimeters long. The lips are trilobed with a tiny callus present at the forward angle of the basal lobes with the middle lobe. Except for their minute size, the flowers are basically similar to those of *T. intricata* and *T. scabridula*. Examinations of a hydrated flower of an isotype of *T. pusilla* and a flower of the holotype of *T. roraimensis* reveal them to be practically identical.

Trichosalpinx quitensis (Rchb. f.) Luer, Phytologia 54: 397, 1983. Fig. 73.

Bas.: *Pleurothallis quitensis* Rchb. f., Bonplandia 3: 240, 1855.

Ety.: Named for the city of Quito, near where the species was collected.

Syn.: *Humboldtia quitensis* (Rchb. f.) Kuntze, Rev. Gen. Pl. 2:668, 1891.

Syn.: *Pleurothallis brevispicata* C.Schweinf., Bot. Mus. Leafl. 10: 173, 1942.

Ety.: From the Latin *brevispicatus*, "with short racemes," referring to the inflorescence.

Syn.: *Trichosalpinx brevispicata* (C.Schweinf.) Luer, Phytologia 54: 394, 1983.

Plant small to medium in size, epiphytic, caespitose; roots slender. Ramicauls erect, more or less stout, 2-12 cm long, enclosed by 5-9 minutely ciliate, lepanthiform sheaths. **Leaf** erect, thickly coriaceous, elliptical to narrowly elliptical, subacute to obtuse, 12-55 mm long including a petiole 2-7 mm long, 5-9 mm wide, cuneate below into the petiole. **Inflorescence** a congested, simultaneously few-flowered raceme, 6-25 mm long including the peduncle 5-7 mm long, from near the apex of the ramicaul within the uppermost cauline sheath; floral bracts infundibular, 2-2.5 mm long, enclosing the pedicel and ovary; pedicels 1-3 mm long; ovary 1 mm long; **sepals** light yellow, fleshy-carinate, glabrous, the dorsal sepal ovate, concave, subacute, 4-5.5 mm long, 2-3.5 mm wide, 3-veined, barely connate to the lateral sepals, the lateral sepals triangular, acute, acuminate, 3-4.5 mm long, 1-1.5 mm wide, 1-veined, connate 0.5 mm; **petals** light yellow, membranous, elliptical-oblong, rounded to slightly retuse at the apex, 2.5-3 mm long, 1.5-2 mm wide, 1-veined; **lip** light yellow, thick, ovoid, 2-2.5 mm long, 1-1.5 mm wide, the apex rounded, the disc broadly and shallowly concave between a pair of low calli below the middle, ending in small, uncinate processes at the base, the base truncate, hinged on the end to the column-foot; **column** stout, terete, 1 mm long, with the thick foot 2 mm long, the anther subapical, the stigma ventral.

ECUADOR: Prov. of Pichincha: near Quito, 1847, *W. Jameson 65* (Holotype: W; Isotypes: BR, K); Páramo around Quito, alt. 4000 m, *I. Nielsen 76634* (MO). Prov. of Carchi: epiphytic in scrubby trees in paramo west of Tulcán, alt. ca. 3800 m, 22 Feb. 1992, *S. Dalström et al. 1543* (MO). Prov. of Imbabura: Laguna San Marcos, north slopes of Volcán Cayambe, alt. 12,800 ft., 10 July 1944, *W. B. Drew E-304* (AMES). Prov. of Loja: epiphytic in scrubby brush in the paramo east of Yangana, alt. 3200 m, 22 March 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10778* (MO); epiphytic in cloud forest above Jimbura, alt. 3350 m, 21 Mar. 1984, *C. Luer, S. Dalström, T. Hõijer & J. Kuijt 9637* (MO). Prov. of Napo: epiphytic in scrubby vegetation above Papallacta, alt. 3600 m, March 1983, *A. Hirtz 1272* (MO), C. Luer illustr. 16211. Prov. of Tungurahua: Llanganates Mountains, epiphytic on small trees, Cerro Pan de Azucar, alt. 3900 m, 14 Aug. 1969, *P. J. Edwards 107* (K), C. Luer illustr. 16404.
PERU: Dept. of Huánuco: Yanano, alt. 1800 m, 13-16 May 1923, *J. Francis Macbryde 3838* (holotype of *P. brevispicata*: F; Isotype: AMES); Tambo de Vaca, alt. 1800 m, 10 June 1923, *Macbryde 4344* (AMES, W). Dept. of San Martín: Huallaga, Río Apisoncho, alt. 3600 m, 28 Aug. 1965, *A. C. Hamilton & P. M. Holligan 307* (K).
BOLIVIA: Dept. of La Paz: Nor Yungas, above Unduavi, alt. 3300 m, 22 Jan. 1983, *C. Luer, J. Luer & R. Vásquez 8536* (SEL). Dept. of Cochabamba: Chapare, northeast of Cochabamba toward Villa Tunari, alt. 2500 m, 22 Jan. 1980, *C. Luer, J. Luer & R. Vásquez 4912* (SEL); old, abandoned road from Cochabamba to Villa Tunari, alt. 3150 m, 1 Feb. 1997, *C. Luer, J. Luer, R. Vásquez, D. Ric & W. Teague 18362* (MO).

This species occurs in scrubby trees at a high altitude where nights are cold, and where we humans find it difficult to hike and take a deep breath. First described from a collection by Dr. Jameson near Quito, Ecuador, *T. quitensis* has been found to be somewhat variable in a wide distribution south through Peru into central Bolivia.

Vegetatively, the size and shape of the leaves are variable in different populations through the range of distribution. In habit *T. quitensis* resembles species of subgenus *Trichosalpinx* because of the relatively stout, non-prolific ramicauls and the short, congested inflorescence. The flowers, however, suggest subgenus *Tubella*. They are distinguished by the small, fleshy sepals; obtuse petals; and a thick lip with small, erect, uncinate processes on the calli above the base.

Trichosalpinx robledorum (Luer & Escobar) Luer, Phytologia 54: 397, 1983. Fig. 74.
Bas.: *Pleurothallis robledorum* Luer & Escobar, Orquideología 14: 170, 1991.
Ety.: Named in honor of Dr. Oscar Robledo and Sra. Martha Posada de Robledo of Medellín, Colombia, who have successfully cultivated this species.

Plant medium to large in size, up to 50 cm tall exclusive of the inflorescence, epiphytic to terrestrial, caespitose, branching above; roots slender. Ramicauls erect, slender to relatively stout, prolific, 5-17 cm long, enclosed by 5-10 closely appressed, ribbed but smooth lepanthiform sheaths with minutely scabrous ostia. **Leaf** erect, coriaceous, elliptical, subacute to obtuse, 3-6 cm long including the petiole up to 1.5 cm long, 1-1.8 cm wide, cuneate below into a petiole. **Inflorescence** a subdense, secund, simultaneously several-flowered raceme 7-18 cm long including the peduncle 2-9 cm long, from near the apex of a ramicaul; floral bracts 1-2 mm long; pedicels 3-5 mm long; ovary 1-1.5 mm long; **sepals** white,

orange at the base, glabrous, carinate, the dorsal sepal ovate, concave basally, acute, 12-20 mm long, 5-6 mm wide, 3-veined, connate to the lateral sepals for 0.5 mm, the lateral sepals narrowly triangular, oblique, acute, 12-18 mm long, 3-4 mm wide, connate at the base, 1-veined; **petals** oblong, with the apex obtuse to rounded, 3-4.5 mm long, 1 mm wide, 1-veined; **lip** pale green, orange toward the base, subquadrate, arcuate, 3.5-4.5 mm long, 2.5-3 mm wide, the margins minutely erose, the apex broadly rounded, the disc with a pair of longitudinal, converging calli, the base narrowly truncate, hinged to the column-foot; **column** green, terete, stout, 2.5 mm long, with prominent, triangular wings above the middle, the foot equally long, the anther subapical, the stigma ventral.

COLOMBIA: Dept. of Antioquia: Munic. of Santuario, alt. 1800-2200 m, collected by J. M. Serna, 1968, cultivated at La Ceja by M. & O. Robledo, R. Escobar 596, flowered in cultivation 20 Jan. 1978, *C. Luer 2293* (Holotype: SEL; Isotype: JAUM); Repressa Carolina, alt. 2150 m, collected by E. Valencia, July 1988, flowered in cultivation at Colomborquídeas, 22 Mar. 1989, *C. Luer 14348* (MO). Dept. of Nariño: epiphytic near Altiquer, west slopes of the cordillera of Pasto, alt. 1200 m, July 1879, *F. C. Lehmann 569* (G, W).
ECUADOR: Prov. of Carchi: between Maldonado and Tulcán, alt. 2900-3100 m, 5 Oct. 1981, *L. Werling & S. Leth-Nissen 288* (AMES, QCA); epiphytic in cloud forest east of the pass east of Maldonado, alt. 2500 m, 2 Apr. 1984, *C. Luer, S. Dalström & T. Höijer 9895* (MO); same area, terrestrial, alt. 2600 m, 1 Aug. 1985, *C. H. Dodson & A. Embree 16141* (MO); same area, terrestrial on the road embankment, alt. 2500 m, 15 Jan. 1992, *C. Luer, J. Luer, P. Jesup & A. Jesup 16042* (MO).

This handsome species has perhaps the largest flowers of the genus. Vegetatively, it is challenged by *T. arbuscula*. Tall, leafy "stems" stand in clumps and bear long racemes of numerous, large, snow white flowers with a little suffusion of orange at the base. It occurs locally in the Central Cordillera of Colombia and northern Ecuador where plants occasionally colonize the damp, clay road embankments.

Trichosalpinx scabridula (Rolfe) Luer, Phytologia 54: 397, 1983. Fig. 75., 76.

Bas.: *Pleurothallis scabridula* Rolfe, Mem. Torrey Bot. Club 4: 260, 1895.

Ety.: From the Latin *scabridulus*, "a little scabrous," in reference to sheaths of the ramicaul.

Plant small to very small, epiphytic, scandent, prolific, branching, erect to suberect, up to 10 cm or more long; roots slender at the base. Ramicauls ascending, slender, producing another ramical from the apex, 5-10 mm long above, the lower ramicauls up to 25 mm long, enclosed by 2-4 minutely ciliate, lepanthiform sheaths. **Leaf** often purplish, ascending, thickly coriaceous, elliptical to suborbicular, lens-shaped, obtuse to rounded at the apex, 3.5-6 mm long, 2-4 mm wide, broadly cuneate or rounded below into a petiole 0.5 mm long. **Inflorescence** a loose, subflexuous, distichous, simultaneously few-flowered raceme 2-3 cm long including the filiform peduncle 5-8 mm long, from near the apex of a ramicaul; floral bracts 1 mm long; pedicels 2-4 mm long; ovary 0.5 mm long; **sepals** pale yellow, glabrous, subcarinate, the dorsal sepal ovate-triangular and concave below the middle, acute, acuminate above the middle, 4.5-7 mm long, 1.5-2.5 mm wide, 3-veined, barely connate to the lateral sepals, the lateral sepals connate at the base, narrowly triangular, attenuate, acute, oblique, 4.5-7 mm long, 0.75-1 mm wide, 1-veined; **petals** membranous, elliptical, oblique, subacute to obtuse, 1.75-2 mm long, 0.5-1 mm wide, 1-veined; **lip** yellowish, oblong-trilobed, 2-3 mm long, 1-1.2 mm wide across the lobes, the apical lobe oblong with the apex rounded, the lateral lobes low, erect, broadly rounded, below the middle, with a very small, often obscure callus at the forward angle of the lobes, the base unguiculate-truncate, hinged to the column-foot; **column** terete, 1-1.5 mm long, with small, obtuse, often obscure, apical wings, the foot 0.5 mm long, the anther subapical, the stigma ventral.

BOLIVIA: Dept. of La Paz: Murillo, Zongo, Nov. 1890, *A. M. Bang 907* (Holotype: K, Isotypes: AMES, MO, NY, US, W), C. Luer illustr. 17260; Murillo, Zongo valley, up Río Jachcha Cruz, alt 2200 m, 16 Dec. 1982, *J. C. Solomon 9082* (MO); east of Chuspipata, alt. 2500 m, 21 Jan. 1984, *C. Luer, J. Luer, & R. Vásquez 9421* (SEL); east of Chuspipata, alt. 2750 m, 24 Nov. 1992, *C. Luer, J. Luer, R. Vásquez, D. Ric & W. Teague 16490* (MO); Saavedra, along Río Charazani, alt. 2700 m, 19 Nov. 1992, *C. Luer, J. Luer et al. 16434, 16455* (MO). Dept. of Cochabamba: Chapare, along road from Cochabamba to Villa Tunari, alt. 1900 m, 29 Jan. 1984, *C. Luer, J. Luer & R. Vásquez 9454* (SEL); same area, alt. 2800 m, 15 Jan. 1988, *C. Luer, J. Luer, R. Vásquez et al. 12832, 12874* (MO).
PERU: Dept. of Junín: La Merced, Hda. Schunke, alt. ca. 4000 ft., Oct. 1941, *J. F. Macbride 5781* (AMES). Dept. of Pasco: Oxapampa, Cordillera Yanachaga, Cerro Pajonal, alt. 2700-2800 m, 7 Oct. 1982, *R. B. Foster 9033* (MO); Oxapampa, west of Oxapampa, alt. 2080 m, 19 Nov. 1982, *D. Smith 2724* (MO); San Gotardo, west of Oxapampa, alt. 2850 m, 21 Nov. 1982, *D. Smith 2758* (MO).

This little species, first collected in 1890 by Miguel Bang in the Zongo valley northeast of La Paz, is widely distributed on the eastern slopes of the Andes of southern Peru and Bolivia. It is distinguished by short, proliferating ramicauls that create branching, leafy stems, often accumulating into tangled mats. Loose, simultaneously several-flowered racemes with acute sepals and obtuse petals are produced. The lip possesses a pair of low, broadly rounded lobes below the middle, with a low, minute, often obscure callus near the forward angle of the lobe. Otherwise, the disc is featureless.

Trichosalpinx scabridula is allied to *T. intricata*, differing mainly in the prolific, scandent habit. A larger, long-scandent species with long-acuminate sepals is recognized as *T. notosibirica*. Intermediate collections are not uncommon (Fig. 76.).

Trichosalpinx semilunata (Luer) Luer, Phytologia 54: 397, 1983. Fig. 77.

Bas.: *Pleurothallis semilunata* Luer, Selbyana 3: 184, 1976.
Ety.: From the Latin *semilunatus*, "crescent-shaped," in reference to calli of the lip.

Syn.: *Trichosalpinx dithele* Luer & Escobar, Orquideología 16: 181, 1984.
Ety.: From the Greek *dithele*, "two nipples," referring to the pair of lobules on the column.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 1.5-6.5 cm long, enclosed by 3-7 minutely scabrous, lepanthiform sheaths. **Leaf** erect, coriaceous, elliptical, obtuse, 10-27 mm long, 5-10 mm wide, cuneate below into a petiole 2-5 mm long. **Inflorescence** a fascicle of loose, simultaneously 1- to 3-flowered racemes ca. 1 cm long, including the slender peduncles 3-10 mm long, from near the apex of a ramicaul; floral bracts 1-2.5 mm long; pedicels 1.5-2.5 mm long; ovary 0.5-1 mm long; **sepals** pale yellow, sometimes suffused with purple below the middle, glabrous, subcarinate, the dorsal sepal ovate, acute, concave, 4-7 mm long, 1.5-2.25 mm wide, 3-veined, barely connate basally, the lateral sepals free, elliptical-triangular, acute, oblique, 4-7 mm long, 1-1.75 mm wide, each lightly 2-veined; **petals** yellow, elliptical, oblique, subacute to obtuse, 2-3 mm long, 1-1.25 mm wide, 1-veined; **lip** yellow, more or less suffused with purple, thick, often arcuate, oblong-subtrilobed, obtuse, 2-3.75 mm long expanded, 1-1.2 mm wide, the sides erect below the middle with obtuse angles, the disc with a pair of rounded calli on the middle third, the base truncate, hinged to the column-foot; **column** terete, 1-1.5 mm long, with a pair of rounded calli near the middle of the undersurface, the anther subapical, the stigma ventral.

ECUADOR: Prov. of El Oro: epiphytic on mossy twigs, between Piñas and Santa Rosa, alt. ca. 1500 m, 9 Aug. 1975, *C. Luer, G. Luer & S. Wilhelm 523* (Holotype: SEL); km 19 between Piñas and Sta. Rosa, alt. 460 m, 7 Oct. 1979, *C. H. Dodson & G. Shupp 8932* (MO); south of Piñas, alt. 950-1000 m, 20 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10664* (MO). Prov. of Bolívar: between Guaranda and Catarama, alt. 900 m, July 1991, flowered in cultivation at Chamblee, GA, by *F L Stevenson 91-0802-9* (MO). Prov. of Los Rios: in citrus trees below Balzapamba, alt. 700 m, 23 Mar. 1984, *C. Luer, S. Dalström, T. Höijer & J. Kuijt 9670* (MO).
COLOMBIA: Dept. of Antioquia: Represa de Guadalupe, collected by R. Escobar 1424, flowered in cultivation at La Ceja by M. & O. Robledo, 2 Oct. 1977, *C. Luer 1890* (SEL); Munic. of Frontino, epiphytic in forest near the gold mine at El Plateado, alt. 2060 m, 5 May 1983, *C. Luer, J. Luer, R. Escobar, A. Pridgeon & E. Valencia 9044* (holotype of *T. dithele*: SEL); between Nutibara and Frontino, alt. 1900 m, 5 May 1983, *C. Luer et al. 9024* (SEL); Munic. of Cocorná, Quebrada La Hundida, alt. 1600 m, 24 Apr. 1983, *C. Luer, J. Luer, R. Escobar et al. 8792* (SEL); same area, alt. 1700 m, 20 Mar. 1989, *C. Luer, J. Luer, R. Escobar & W. Teague 14324* (MO); same area, Quebrada El Viao, flowered in cultivation at Colomborquídeas, 23 May, 1995, *C. Luer 17591* (MO); Munic. of Yarumal, between Ventanas and El Cedro, alt. 1650 m, 15 Mar. 1989, *C. Luer, J. Luer, S. Dalström & W. Teague 14154* (MO).

This little species is frequent at relatively low altitudes in from the Central Cordillera of Colombia to southwestern Ecuador. It is distinguished by the short, few-flowered racemes of pale yellow flowers with acute sepals and subacute petals. The lip is thick, arcuate, oblong with erect margins below the middle. The middle third of the disc is filled with a pair of thick, rounded, semilunate calli. Most distinctive is a pair of nipple-like calli on the undersurface of the column.

Trichosalpinx solomonii Luer, sp. nov. Fig. 78.

Ety.: Named in honor of Dr. James C. Solomon of the Missouri Botanical Garden who discovered this species.

Species haec *T. notosibiricae* (Hashimoto) Luer affinis sed ramicaulibus radicibusque crassissimis, foliis anguste ellipticis et pedicelis brevioribus distinguitur.

Plant medium in size to large, epiphytic, scandent, up to 30 cm tall; roots thick, fleshy. Ramicauls stout, erect, prolific, up to 15 cm long below, 8-10 mm long above, enclosed by up to 10 ciliate, lepanthiform sheaths below, 2-3 sheaths above. **Leaf** erect, coriaceous, narrowly elliptical, subacute to obtuse, 10-15 mm long, 2-3 mm wide, narrowly cuneate below into the 1 mm long petiole. **Inflorescence** a loose, lightly flexuous, more or less simultaneously several-flowered raceme, 2-4 cm long, including the filiform peduncle 1 cm long, from near the apex of the ramicaul; floral bracts 1.75 mm long; pedicels 3 mm long; ovary 1 mm long; **sepals** translucent pale yellow, glabrous, subcarinate, the dorsal sepal ovate in the lower third, concave, acute, long-acuminate, 14 mm long, 2.5 mm wide, 3-veined, barely connate basally to the lateral sepals, the lateral sepals narrowly linear-triangular, acute, attenuate, 15 mm long, 1 mm wide, 1-veined, barely connate at the base; **petals** translucent, elliptical, oblique, acute, 3 mm long, 0.8 mm wide, 2-veined; **lip** light yellow, ovate-trilobed, 3.5 mm long, 1 mm wide, 2 mm wide across the expanded lobes, the apical lobe oblong, obtuse to rounded at the apex, with the lateral lobes on the lower quarter, erect, antrorse, obtuse to rounded, the disc with an obtuse, conical callus at the forward angle of lateral lobes, the base subunguiculate, hinged to the column-foot; **column** terete, 1.5 mm long, the anther subapical, the stigma ventral, the foot 0.8 mm long.

BOLIVIA: Dept. of La Paz: Murillo, Valle del Río Zongo, alt. 3000 m, 8 Jan. 1988, *J. C. Solomon 17452* (Holotype: MO), C. Luer illustr. 17308.

This species is known from one collection in the Zongo Valley at a high altitude by Solomon. The flowers are very similar to those of *T. notosibirica*, but the habit of *T. solomonii* is distinct. From a mass of thick, fleshy roots, the stout, basal ramicauls, up to 15 cm long, arise. Above, the ramicauls are prolific, and decrease in size, eventually to less than 1 cm long. The leaves are small and narrowly elliptical. The racemes are comparatively short with short pedicels.

Trichosalpinx steyermarkii Luer, sp. nov. Fig. 79.

Ety.: Named in honor of Dr. Julian A. Steyermark, indefatigible collector of botanical specimens.

Species haec *T. pusillae* (H.B.K.) Luer affinis, sed habitu minore, labelli lobis lateralibus dimidio inferiore occupantibus et lobo anteriore triangulari differt.

Plant extremely small, epiphytic, caespitose; roots slender, but comparatively thick. Ramicauls erect, 3-4 mm long, enclosed by 2-3 microscopically scabrous, lepanthiform sheaths. **Leaf** erect, thickly coriaceous with convex surfaces, suborbicular, obtuse, 3-4 mm long, 2-3 mm wide, broadly cuneate below into a petiole 0.25 mm long. **Inflorescence** a solitary flower or a loose, 2-flowered raceme 10-15 mm long including the filiform peduncle 10-12 mm long, from near the apex of a ramicaul; floral bracts 0.75 mm long; pedicels 2 mm long; ovary 0.5 mm long; **sepals** apparently yellow or white, glabrous, subcarinate, the dorsal sepal ovate-triangular, concave, acute, 2.5 mm long, 1.25 mm wide, 3-veined, barely connate to the lateral sepals, the lateral sepals narrowly triangular, oblique, acute, 2.5 mm long, 0.5 mm wide, each 1-veined, connate 0.3 mm; **petals** translucent, elliptical, subacute to obtuse, 1.25 mm long, 0.3 mm wide, vein not visible; **lip** ovate-trilobed, 1.75 mm long, 1.25 mm wide across the lobes, the apical lobe triangular, narrowly obtuse, the lateral lobes occupying the lower half, erect, broadly obtuse, the disc with a faint, rounded callus at the forward angles of the lobes, the base unguiculate-truncate, hinged to the column-foot; **column** semiterete, 0.5 mm long, the foot short, the anther and the stigma ventral.

VENEZUELA: Edo. Bolívar: Auyan-tepui, alt. 1800 m, 7 May 1964, *J. A. Steyermark 93547* (Holotype: AMES; Isotypes: K, NY), C. Luer illustr. 17259.

Trichosalpinx pusilla is a frequent, tiny species distributed widely at high altitudes from the tepuis of Venezuela, to south in the Andes from Colombia into Peru. Among numerous collections made by Steyermark from the Venezuelan

tepuis, one collection from a lower altitude seemed exceptionally minute. A flower hydrated in concentrated ammonia revealed a minute lip with morphological features that differed from others examined. It is possible that this collection represents merely an aberration from the usual *T. pusilla*, but it is also possible that it is indeed distinct and that other unrecognized collections are mixed among the numerous collections cited for *T. pusilla*.

Trichosalpinx steyermarkii is the smallest member of the genus. The suborbicular leaves less than four millimeters long are borne by ramicauls also less than four millimeters long. The sepals are two and a half millimeters long. The lip with lobes filling the basal half with the anterior lobe triangular differs from the oblong lip of *T. pusilla* with lobes on the basal quarter or third.

Trichosalpinx strumifera Luer, sp. nov. Fig. 80.

Ety.: From the Latin *strumifer*, "bearing a swelling," in allusion to the large chin of the lateral sepals.

Planta parva pendens repensve, ramicaulibus proliferantibus, racemo paucifloro foliis parvis ellipticis plus minusve aequilongo, sepalis glabris ovatis ad medium connatis, petalis ellipticis, labello oblongo trilobato, lobo antico rotundo minute papilloso, lobis lateralibus longiciliato supra medium obtusis et inter lobos disco villoso.

Plant small, epiphytic, prolific, creeping to pendent, up to 20 cm or more long; roots slender at the base. Ramicauls ascending or descending, slender, producing another ramicaul from the apex, 15-20 mm long, enclosed by 3 ciliate, lepanthiform sheaths. **Leaf** ascending or descending, thickly coriaceous, broadly elliptical, subacute to obtuse, 7-10 mm long, 4-6 mm wide, contracted below into a petiole 0.5-1 mm long. **Inflorescence** a few-flowered, secund raceme up to 10 mm long including the peduncle ca. 2 mm long, from near the apex of a ramicaul; floral bract 1 mm long; pedicel 2 mm long; ovary 0.5 mm long; **sepals** translucent white, glabrous, subcarinate, the dorsal sepal ovate, subacute, concave, 5 mm long, 2.25 mm wide expanded, 3-veined, connate to the lateral sepals for 2.5 mm, the lateral sepals ovate, oblique, 4.5 mm long, connate 2.5 mm to form a prominent, subglobose mentum at the base, 3.5 mm wide expanded, each 1-veined; **petals** translucent, elliptical, oblique, subacute, 3 mm long, 1.5 mm wide, 1-veined; **lip** white, oblong-obovate, trilobed, 3 mm long, 0.75 mm wide, 1.5 mm wide expanded, the apical lobe rounded, cellular-papular, the lateral lobes long-ciliate, ending in obtuse angles above the middle, the disc villous between the lateral lobes, the base subtruncate, hinged to the column-foot; **column** terete, 2 mm long, the anther subapical, the stigma ventral.

ECUADOR: Prov. of Zamora-Chinchipe: epiphytic in cloud forest above Valladolid, alt. 2000 m, 18 Mar. 1984, *C. Luer, A. Hirtz, S. Dalström, T. Höijer & J. Kuijt 9820* (Holotype: MO); same area, alt. 2300 m, 1 Feb. 1985, *G. Harling & L. Anderson 21378* (GB).

Vegetatively, this long-creeping species from southeastern Ecuador is similar to several others (i.e. *T. chamaelepanthes*), but it is distinguished from them by a short, few-flowered raceme; obtuse sepals connate for about half their length, and obliquely elliptical petals. The lip is deeply three-lobed with obtuse, ciliate lateral lobes extending above the middle, and villous between them. The ovate anterior lobe is minutely papillose.

Trichosalpinx systremmata (Luer) Luer, Phytologia 54: 397, 1983. Fig. 81.

Bas.: *Pleurothallis systremmata* Luer, Phytologia 49: 219, 1981.

Ety.: From the Greek *systremmatos*, "aggregated into a ball," in allusion to the habit.

Plant very small, epiphytic, densely caespitose; roots slender. Ramicauls erect, 2-6 mm long, enclosed by 2 ribbed, glabrous to microscopically ciliate, lepanthiform sheaths. **Leaf** erect, coriaceous, broadly elliptical to suborbicular, margined, obtuse, 5-12 mm long, 5-6 mm wide, contracted below into a petiole 1 mm long. **Inflorescence** a loose, successively several-flowered raceme, up to 11 cm long including the filiform peduncle 1-5 cm long, from near the apex of the ramicaul; floral bracts 1-1.5 mm long; pedicels 2-5 mm long; ovary 0.75-1 mm long; **sepals** translucent yellow, glabrous, subcarinate, the

dorsal sepal ovate, concave, acute, 6.5-11 mm long, 3 mm wide, 3-veined, connate to the lateral sepals for 0.25 mm, the lateral sepals narrowly ovate, acute, 5.5-10 mm long, 1-1.25 mm wide, 1-veined, connate 1-1.25 mm; **petals** translucent yellow or purple, obovate, obtuse, more or less retuse, 2-3 mm long, 1.25-1.75 mm wide, 1-veined; **lip** red-brown or purple, fleshy, ovate, 3-3.5 mm long, 1.25-1.75 mm wide, with the erect, obtuse, marginal angles in the basal fourth, the apex rounded, the disc with a pair of low, longitudinal calli from the marginal angles to the middle, the base narrowly truncate, hinged to the column-foot; **column** terete, 1.75-2 mm long, the anther subapical, the stigma ventral.

ECUADOR: Prov. of Loja: epiphytic in cloud forest south of Yangana, alt. 2250 m, 11 May 1981, *C. Luer, J. Luer, D. D'Alessandro et al. 6143* (Holotype: SEL); "Loja," Jan. 1883, *E. André 505* (K); epiphytic in cloud forest along the army road east of Yangana, alt. 2400 m, 22 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10814* (MO); above Vilcabamba, alt. 2000-2400 m, May 1985, *D. D'Alessandro 348, 654* (MO). Prov. of Zamora-Chinchipe: epiphytic in forest east of the pass east of Loja, collected by W. Teague in 1977, flowered in cultivation in Aug. 1979, *C. Luer 4115* (SEL); "Loja," Jan. 1883, *E. André 505* (K).

Trichosalpinx systremmata, apparently endemic in southern Ecuador, was first collected by Eduard-Francois André on his botanical expedition to the Andes over a hundred years ago. Superficially this little species appears very similar to many species of *Pleurothallis*. It is distinguished by the dense tuft of small, broadly elliptical or suborbicular leaves that obscure the short ramicauls. Only with a microscope are the lepanthiform sheaths evident. Long, loose racemes of successive, long-pedicellate flowers are produced. The acute sepals are more or less acuminate and thickened. The petals are obovate, and the simple lip is ovoid with the apex rounded. The terete column is typical of subgenus *Tubella*.

Fig. 82.

Trichosalpinx tantilla Luer, comb. nov.

Bas.: *Pleurothallis tantilla* Luer, Selbyana 5: 183, 1979.

Ety.: From the Latin *tantillus*, "so little," referring to the habit.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect to suberect, prolific, commonly only 2 superposed, each 7-20 mm long, enclosed by 2-4 lepanthiform sheaths with ciliate ostia. **Leaf** erect, thickly coriaceous, elliptical, obtuse, 7-10 mm long, 5-7 mm wide, contracted below into a petiole 1 mm long. **Inflorescence** a loose, simultaneously several-flowered raceme, up to 35 mm long, including the filiform peduncle 5-7 mm long, from near the apex of the ramicaul; floral bracts 1 mm long; pedicels 2 mm long; ovary 0.25 mm long; **sepals** yellow-green, more or less suffused with purple along the veins, glabrous, carinate, the dorsal sepal ovate, concave, acute, 2.5-3.5 mm long, 1.25 mm wide, 3-veined, the lateral sepals free, ovate-triangular, oblique, acute, 2-2.5 mm long, 1 mm wide, 1-veined; **petals** translucent yellow, obovate, oblique, subacute, 1.5 mm long, 0.5 mm wide, 1-veined; **lip** green, suffused with purple, thick, ovoid, obscurely 3-lobed, arcuate, 1.5 mm long, 1 mm wide, the lateral lobes broadly rounded, below the middle, the apex thick, convex, cellular-glandular, obtuse, the disc with a pair of low, parallel calli from a shallowly concave base to the callous apex, the base subtruncate, hinged to the column-foot; **column** slender, terete, without wings, 1 mm long, with a foot 0.25 mm long, the anther subapical, the stigma ventral.

PANAMA: Prov. of Coclé: epiphytic in cloud forest above El Valle, alt. 1000 m, 6 Mar. 1976, *C. Luer, J. Luer, P. Taylor & R. Dressler 1078* (Holotype: SEL); epiphytic in orange grove above El Valle, alt. 1000 m, 2 Sept. 1976, *C. Luer & H. Butcher 1122* (SEL); La Mesa above El Valle, alt. ca. 900 m, 27 Sept. 1977, *J. P. Folsom 5625* (MO). Without locality, alt. 400-800 m, collected by W. Rauh, flowered in cultivation at Botanischer Garten Heidelberg, 1 Sept. 1987, *C. Luer 12912* (MO).

Superficially, this little Panamanian species is similar to the *T. dura*-complex: small ramicauls proliferating one or two others, and simultaneously several-flowered racemes two to three times as long as the leaf. The tiny yellow-green flowers are suffused with purple along the veins of the sepals and on the lip. The sepals are carinate; the petals are subacute; and the obscurely three-lobed lip is bicarinate with a thickened apex. The slender column is devoid of any wing.

Trichosalpinx teaguei Luer, sp. nov. Fig. 83.

Ety.: Named in honor of Walter Teague of San Francisco, CA, co-discoverer of this species.

Planta mediocris, ramicaulium vaginis tubulosis apice ciliatis, racemis laxe fractiflexis foliis crassis linearibus angustissime ellipticis subaequilongis, sepalis ovatis acutis lateralibus liberis expansis, petalis ovatis acutis, et labello grandi elliptico basi bilobato, lobis brevibus auriculatis.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 2-9 cm long, enclosed by 5-8 closely appressed, lepanthiform sheaths with minimally dilated, long-ciliate ostia. **Leaf** erect, thickly coriaceous, narrowly linear-ovate, acute, 3-7 cm long, 0.4-0.5 cm wide, narrowly cuneate below into a petiole 0.6-1 cm long. **Inflorescence** a loose, lightly flexuous, simultaneously several-flowered raceme, 3-5 cm long, including the peduncle 1-1.5 cm long, from near the apex of the ramicaul; floral bracts 3-4 mm long; pedicels 3-4 mm long; ovary 1.5 mm long; **sepals** whitish with red stripes along the veins, glabrous, subcarinate, the dorsal sepal ovate, acute, 11 mm long, 3.75 mm wide, 3-veined, the lateral sepals free, widely expanded, triangular, oblique, acute, 10.5 mm long, 3 mm wide expanded, 2-(3-)veined; **petals** translucent, ovate, acute, 5 mm long, 2 mm wide, 1-veined; **lip** whitish, veined in red, elliptical, rounded at the apex, trilobed at the base, 7.5 mm long, 3.5 mm wide, with the basal lobes small, erect, antrorse, rounded, the disc with a pair of calli extending forward from the bases of the lobes, the base truncate, hinged to the column-foot; **column** slender, arcuate, terete, 3 mm long, the anther subapical, the stigma ventral, the foot stout.

BOLIVIA: Dept. of La Paz: Saavedra, epiphytic in trees along Río Charazani, alt. 2470 m, collected 20 Nov. 1992, flowered in cultivation in San Francisco, CA, *W. Teague 240* (Holotype: MO), C. Luer illustr. 17747; same collection data, *C. Luer, J. Luer, R. Vásquez, D. Ric, J. Del Hierro & W. Teague 16449* (MO).

This species, known from a remote, isolated valley in northern Bolivia, is closely related to *T. costata* from the Nor Yungas. It is distinguished from the latter by the ciliate margins of the ramicauls that are totally glabrous in *T. costata*, narrower leaves and larger, red-striped flowers. The sepals of *T. teaguei* are completely free and widely spread, and the lip is proportionately larger with smaller, rounded, instead of acute, basal lobes.

Trichosalpinx tenuis (C.Schweinf.) Luer, Phytologia 54: 397, 1093. Fig. 84.

Bas.: *Pleurothallis tenuis* C.Schweinf., Bot. Mus. Leafl. 10: 190, 1942.

Ety.: From the Latin *tenuis*, "thin," but no clue is given to indicate what is "thin."

Syn.: *Trichosalpinx vertex* Luer & Escobar, Orquideología 16: 186, 1984.

Ety.: From the Latin *vertex*, "the highest point," in allusion to the high altitude of the habitat.

Plant medium in size, epiphytic, caespitose; roots thick. Ramicauls relatively stout, erect, 2-4 cm long, enclosed by 4-6 closely appressed, microscopically scabrous, lepanthiform sheaths. **Leaf** erect to suberect, thickly coriaceous, elliptical to broadly elliptical, subacute to obtuse, 12-22 mm long, 6-12 mm wide, contracted below into a petiole 1-2 mm long. **Inflorescence** a suberect, subdense, secund, simultaneously several-flowered raceme 2-5 cm long including the peduncle ca. 1 mm long, from near the apex of a ramicaul; floral bracts 1-2 mm long; pedicels 2-3 mm long; ovary 1-1.5 mm long; **sepals** yellow, glabrous, carinate, the dorsal sepal ovate-triangular, acute, concave below the middle, 7-11 mm long, 2-2.5 mm wide above the base, 3-veined, barely connate to the lateral sepals, the lateral sepals narrowly triangular, oblique, acute, attenuate, 7-11 mm long, 1 mm wide, connate 1-1.5 mm, each 1-veined; **petals** membranous, elliptical, oblique, acute, 3.5-4 mm long, 1 mm wide, 1-veined; **lip** yellow, oblong-ovate, subtrilobed, 3-3.5 mm long, 1.5 mm wide across the lobes, the apical half ovate with the apex narrowly rounded, cellular-glandular, the lateral lobes low, erect, broadly rounded, below the middle, the disc with a longitudinal, cleft callus above the base, the base truncate, hinged to the column-foot; **column** terete, 1.5-2 mm long, the anther subapical, the stigma ventral, the foot 1 mm long.

PERU: Dept. of Cuzco: collected by C. Bues, *F. L. Herrera 2157* (Holotype: US), C. Luer illustr. 17923. Dept. of Ayacucho: Aina, between Huanta and Río Apurimac, alt. 750-1000 m, 17 May 1929, *E. P. Killip & A. C. Smith 22539* (AMES).
BOLIVIA: Dept. of Cochabamba: Chapare, El Balconcillo, terrestrial on wet, mossy embankment, alt. 3200 m, 18 Nov. 1984, *C. Luer, J. Luer & R. Vásquez 10498* (MO).

ECUADOR: Prov. of Loja: southeast of Yangana along the road to the army post, alt. 2950 m, 22 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10791* (MO); between Loja and Zamora, alt. ca. 2800 m, 20 Mar. 1972, *G. Harling 11341* (GB). Prov. of Morona-Santiago: Campamento San Miguel between Sigsig and Gualaquiza, 9 Apr. 1968, *G. Harling, G. Storm & B. Ström 8125* (GB). Prov. of Zamora-Chinchipe: epiphytic in scrub forest east of the pass east of Loja, alt. 2700 m, 11 Feb. 1978, *C. Luer, J. Luer & M. Portilla 2531* (SEL); east of the pass between Loja and Zamora, alt. 2750 m, 21 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10695* (MO).
COLOMBIA: Dept. of Tolima: El Campanario, Alto de La Linea, epiphytic and on the road cut at the pass between Ibagué and Armenia, alt. 3500 m, 20 Nov. 1982, *C. Luer & R. Escobar 8488* (holotype of *T. vertex*: SEL, COL, JAUM).

This caespitose species is widely distributed at high altitudes from the Central Cordillera of Colombia into central Bolivia. It is distinguished by the small habit; thick, elliptical leaves; and a suberect, secund inflorescence two to three times as long as the leaf. The sepals are carinate, acute and attenuate, and the petals are elliptical and acute. The ligulate lip possesses a pair of low, broadly rounded lobes below the middle, and a low, longitudinal, channeled callus on the disc above the base.

Fig. 85.

Trichosalpinx teres Luer, sp. nov.

Ety.: From the Latin *teres*, "terete," referring to the leaves round in cross-section.

Planta parva, ramicaulibus prolificantibus, racemo paucifloro foliis teretibus duplolongiore, sepalis crassicarinatis et labello trilobato crasso distinguitur.

Plant small, epiphytic, prolific, erect, roots slender at the base. Ramicauls slender, producing another ramicaul from the apex, 7-9 mm long, enclosed by 2 thin, microscopically ciliate, tubular, lepanthiform sheaths. **Leaf** erect, fusiform-terete, narrowly obtuse, 13-15 mm long, 3 mm wide, 2 mm deep, the base contracted into a petiole less than 1 mm long. **Inflorescence** a loose, secund, simultaneously few-flowered raceme ca. 25 mm long including the filiform peduncle ca. 10 mm long, from near the apex of a ramicaul; floral bracts 1.5 mm long; pedicels 2 mm long; ovary 0.5 mm long; **sepals** yellow, fleshy, thickly carinate, glabrous, the dorsal sepal triangular, acute, thickened toward the apex, 3.5 mm long, 1.5 mm wide, 3-veined, essentially free from the lateral sepals, the lateral sepals thick, narrowly triangular, acute, 3.75 mm long, 1 mm wide, 1-veined, connate 0.5 mm; **petals** membranous, elliptical, subacute to obtuse, 1.8 mm long, 1 mm wide, 1-veined; **lip** yellow, oblong-trilobed, 2.25 mm long, 0.6 mm wide across the middle lobe, 1.4 mm wide across the lateral lobes expanded, the apical lobe oblong, thick, with the apex rounded, the lateral lobes erect, oblique, obtuse, triangular, antrorse, below the middle, with a small callus at the forward angle with the middle lobe, the base truncate, hinged to the column-foot; **column** bialate above the middle, 1.5 mm long, the foot 0.5 mm long, the anther and the stigma ventral.

ECUADOR: Prov. of Zamora-Chinchipe: Cordillera del Condor east of Los Encuentros, alt. 1650 m, 21 Jan. 1989, *C. Luer, J. Luer, P. Jesup & A. Jesup 14048* (Holotype: MO).

This species is known from a single collection in the Cordillera del Condor of southeasternmost Ecuador. It is unique in the genus with thick, fusiform leaves. The ramicauls are prolific, less than one centimeter long, and enclosed by only two, microscopically ciliate sheaths that are neither dilated nor with thick margins at the ostium. The sepals are fleshy and thickly carinate; the petals are membranous and elliptical; the trilobed lip is basically similar to those related to *T. scabridula* with a tiny callus at the junction of the lateral lobes with the middle lobe.

Fig. 86.

Trichosalpinx todziae Luer, Lindleyana 11: 111, 1996.

Ety.: Named in honor of Carol Todzia who discovered this species.

Plant very small, epiphytic, caespitose; roots slender. Ramicauls erect, often proliferating 1 or 2 other ramicauls, each ramicaul 10-15 mm long, enclosed by 3-5 microscopically scabrous, lepanthiform sheaths with ciliate ostia. **Leaf** erect, coriaceous, broadly elliptical, obtuse, 5-8 mm long, 4-6 mm wide, contracted below into a petiole 1 mm long. **Inflorescence** a subdense, subdistichous, successively

several-flowered raceme, 25-30 mm long including the filiform peduncle 10-15 mm long, from near the apex of the ramicaul; floral bracts 1-1.5 mm long; pedicels 1-1.5 mm long; ovary 0.3 mm long; **sepals** pale yellow, glabrous, carinate, the dorsal sepal triangular, acute, acuminate, 3 mm long, 1.2 mm wide, 3-veined, the lateral sepals free, narrowly triangular, arcuate-falcate, acute, attenuate, 3 mm long, 0.66 mm wide, 1-veined; **petals** translucent yellow, elliptical, acute, 1.3 mm long, 0.5 mm wide, 1-veined; **lip** pale yellow, oblong-ovate, 1.5 mm long, 0.66 mm wide, with the margins broadly rounded below the middle, the apex obtuse, thickened, cellular-glandular, the disc with a pair of low, thin, longitudinal calli within the margins just above the middle, and with a low, obscure thickening near the middle, the base truncate, hinged to the column-foot; **column** terete, wingless at the apex, 0.8 mm long, the anther subapical, the stigma ventral.

COSTA RICA: Prov. of San José: Bajo La Hondura, alt. 1100 m, 30 June 1978, *C. Todzia 344* (Holotype: CR), C. Luer ill. 17799. Prov. of Cartago: Tablazo, alt. 1500 m, 28 May 1978, *C. Todzia 291* (CR). PANAMA: Prov. of Chiriquí: without specific locality, collected and cultivated, 1 June 1977, by *F L Stevenson 53177-1* (SEL).

This very small species is closely related to *T. carinilabia* and *T. dura* (*P. foliata* or *P. broadwayi*) all of which are characterized by a caespitose habit with the ramicauls proliferating one or two others, and a subdense inflorescence of small, yellowish white flowers surpassing small elliptical leaves.

From *T. carinilabia*, *T. todziae* is distinguished by short-pedicellate flowers without the prominent mentum, narrowly acuminate sepals, and a lip with small, thin lateral lamellae, and an indistinct midline callus below the middle (instead of three short, thick calli). Although the apex of the lip is thickened, it is far from the large, exceedingly thick apex of *T. carinilabia*.

From *T. dura*, *T. todziae* is distinguished by a smaller habit, smaller, short-pedicellate flowers with narrowly acuminate sepals, a lip with thin lateral calli instead of three, thick calli, and a column wingless at the apex.

Trichosalpinx trilobata (Fawc. & Rendle) Luer, Phytologia 54: 398, 1983. Fig. 87.

Bas.: *Pleurothallis trilobata* Fawc. & Rendle, J. Bot. 47: 4, 1909.

Ety.: From the Latin *trilobatus*, "three-lobed," referring to the trilobed lip.

Plant very small, epiphytic, caespitose; roots slender but as thick as the ramicaul. Ramicauls erect, slender, 3-9 mm long, enclosed by 2-4 microscopically ciliate, lepanthiform sheaths. **Leaf** erect, coriaceous, elliptical, subacute to obtuse, 6-8 mm long, 3-4 mm wide, contracted below into a petiole 1 mm long. **Inflorescence** one, or 2 flowers in a loose raceme 10-27 mm long including the filiform peduncle 5-20 mm long, with the flowers ca. 5 mm apart, from near the apex of a ramicaul; floral bracts 0.5 mm long; pedicels 2-2.5 mm long; ovary 0.5 mm long; **sepals** appear to have been pale yellow, glabrous, subcarinate, the dorsal sepal ovate-oblong, acuminate above the middle, acute, concave, 4 mm long, 1.5 mm wide, 3-veined, barely connate to the lateral sepals, the lateral sepals narrowly triangular, oblique, 3.75 mm long, 1 mm wide, 1-veined, connate 1.5 mm; **petals** membranous, translucent, elliptical, obtuse, 1.5 mm long, 0.7 mm wide, 1-veined; **lip** trilobed, 1.7 mm long, 1.2 mm wide across the lobes, the apical lobe oblong with the apex rounded, the lateral lobes below the middle, erect, broadly rounded, with a low, minute callus low on the anterior margin, the disc featureless, the base truncate, hinged to the column-foot; **column** terete, 1.3 mm long, with small, apical wings at the apex, the foot 0.7 mm long, the anther subapical, the stigma ventral.

JAMAICA: On trunks of trees, between Newhaven Gap and Vinegar Hill, alt. 4000 ft., Feb. *W. Harris 10084* (Holotype: BM; Isotypes: JAMAICA, NY); Ridge from Newhaven Gap to Vinegar Hill, 4 Feb. 1908, *W. Harris 10084* (AMES, NY); Vicinity of Cinchona, ("Pleurothallis parvula, n. sp.") on tree, John Crow Peak, 2-10 Sept. 1906, *N. L. Britton 267* (AMES, BM, NY), C. Luer illustr. 17186.

This tiny species, endemic in a small area of Jamaica, is rarely collected. Apparently it was first collected by Nathaniel Lord Britton of the New York Botanical Garden in 1906, and the annotation label of the specimen is labeled with a tentative "Pleurothallis parvula, n. sp." The species was described three years later from a collection by Harris in 1908.

Trichosalpinx trilobata is distinguished by the minute habit with the leaves as well as the ramicauls less than one centimeter long. The inflorescence, either one or distantly two-flowered, surpasses the leaf. The minute flowers, borne on comparatively long pedicels, are usually cleistogamous. Occupying the lower half of the lip, the lobes of the lip are large and rounded with a minute or microscopic callus on the anterior margin that had not been recorded before.

Trichosalpinx tropida (Luer) Luer, Phytologia 54: 398, 1983. Fig. 88.

Bas: *Pleurothallis tropida* Luer, Phytologia 49: 219, 1981.

Ety.: From the Latin *tropis*, "a keel," referring the carina on the lip.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect to suberect, prolific, usually 2-3 superposed, each 1-3 cm long, enclosed by 2-4 closely appressed, minutely ciliate, lepanthiform sheaths. **Leaf** erect, thickly coriaceous, elliptical, obtuse, 9-12 mm long, 5-7 mm wide, contracted below into a petiole 1 mm long. **Inflorescence** a loose, distichous, flexuous, simultaneously several-flowered raceme, up to 3 cm long, including the filiform peduncle ca. 1 cm long, from near the apex of the ramicaul; floral bracts 0.5 mm long; pedicels 1.5-2 mm long; ovary 0.5 mm long; **sepals** pale yellow-green, glabrous, subcarinate, the dorsal sepal ovate, concave, obtuse, lightly acuminate, 2.5 mm long, 1.5 mm wide, 3-veined, the lateral sepals free, ovate-triangular, oblique, 2 mm long, 1 mm wide, 1-veined; **petals** translucent yellow, broadly elliptical, obtuse, 1 mm long, 0.6 mm wide, 1-veined; **lip** pale green, thick, obovate with the apex broadly rounded, cellular-glandular, 1.5 mm long, 1 mm wide, the disc with a prominent dark green keel from the base to above the middle, the base deflexed, subtruncate, hinged to the column-foot; **column** terete with a pair of antrorse, apical wings flanking the anther, 1 mm long, with a foot 0.5 mm long, the anther apical, the stigma ventral.

PANAMA: Prov. of Coclé: epiphytic in an old orange grove in the hills above El Valle, alt. 1000 m, 2 Sept. 1976, *C. Luer & H. Butcher 1120* (Holotype: SEL).

Superficially this little species is similar to *T. dura* and *T. carinilabia* in habit, but it differs from them in the entire, thick, obovate lip with a single, prominent carina extending from the deflexed base to above the middle. It was originally mistaken for *Pleurothallis broadwayi* var. *tricarinata* (*T. carinilabia*).

Trichosalpinx vagans (Garay & Dunsterville) Luer, Phytologia 54: 398, 1983. Fig. 89.

Bas.: *Pleurothallis vagans* Garay & Dunsterville, Venez. Orch. Ill. 6: 372, 1976.

Ety.: From the Latin *vagans*, "wandering," in allusion to the branching habit.

Plant small to medium in size, epiphytic, prolific, branching, erect to suberect, up to 15 cm or more tall; roots slender at the base. Ramicauls ascending, slender, producing another ramical from the apex, 2-4 cm long (the lower ramicauls to 6 cm long), enclosed by 3-6 lepanthiform sheaths with minutely scabrous ostia. **Leaf** erect, thickly coriaceous, semiterete, narrowly elliptical, acute, 2-3 cm long, 2-3 mm wide, contracted below into a petiole 1-3 mm long. **Inflorescence** a loose, simultaneously few-flowered raceme 4-5 cm long including the filiform peduncle 1.5-2 cm long, from near the apex of a ramicaul; floral bracts 1.5 mm long; pedicels 3-4 mm long; ovary 1 mm long; **sepals** pale yellow, glabrous, subcarinate, the dorsal sepal narrowly triangular, acute, concave, 7 mm long, 2 mm wide, 3-veined, barely connate to the lateral sepals, the lateral sepals narrowly triangular, oblique, acute, 7 mm long, 1 mm wide, 1-veined; **petals** translucent, elliptical, acute, 2 mm long, 0.6 mm wide, 1-veined; **lip** yellow, obovate-trilobed, 2.5 mm long, 0.8 mm wide, the apical lobe oblong with the apex rounded and thickened, cellular-glandular, the lateral lobes below the middle, erect, oblique, obtuse, antrorse, the disc with a pair of tall carinae in the middle third from the lateral lobes and an erect, longitudinal keel down the center of the lip for two thirds the length, the base narrow, subtruncate, hinged to the column-foot; **column** terete, 1.5 mm long, with small, obtuse, apical wings, the foot 1 mm long, the anther apical, the stigma ventral.

COLOMBIA: Dept. of Antioquia: vicinity of Sonsón, alt. 2400-2800 m, 24 Jan. 1970, *L. A. Garay & H. R. Sweet 1066* (Holotype: AMES), C. Luer illustr. 16285.

Trichosalpinx vagans is known only from the type-collection from the Central Cordillera of Colombia. The accompanying description and illustration were made from type-material at AMES. Dunsterville's illustration of a superficially similar species from Venezuela (*Dunsterville 1127*) was used to illustrate *T. vagans*.

Trichosalpinx vagans differs from the Venezuelan *T. dunstervillei* by the smaller flowers, an obtuse mentum, and a lip with a different morphology. The lateral lobes of the lip are located just below the middle instead of above the base; the forward margins of the lobes course onto the anterior lobe instead of being deflexed; a tall, longitudinal keel is located in the center; and the anterior lobe is prominently cellular-glandular.

Trichosalpinx webbiae Luer & Escobar, Orquideología 16: 188, 1984. Fig. 90.

Ety.: Named in honor of Marguerite Webb Head of J & L Orchids, Easton, CT, who discovered this species.

Plant very small, epiphytic, densely caespitose to shortly repent; roots proportionately coarse. Ramicauls suberect, ca. 1 mm long, enclosed by 2 lepanthiform sheaths with microscopically scabrous ostia. **Leaf** suberect to prostrate, mottled with purple beneath, thickly coriaceous, broadly elliptical, obtuse, 4-6 mm long, 2-4 mm wide, contracted below into a subpetiolate base. **Inflorescence** a solitary flower borne by a filiform peduncle 5-6 mm long, from near the apex of the ramicaul; floral bract 0.75 mm long; pedicel 2 mm long; ovary 0.75 mm long; **sepals** pale yellow, suffused with purple along the veins, glabrous, carinate, the dorsal sepal ovate, concave, acute, shortly acuminate, 5 mm long, 2.5 mm wide, 3-veined, the lateral sepals connate to above the middle into an oblong, bifid lamina with acute, acuminate apices, 6 mm long, 2 mm wide, each 1-veined; **petals** translucent, obovate, 2.25 mm long, 1.25 mm wide, 1-veined, the apex subtruncate, irregular or obscurely trilobed; **lip** light yellow, ovate-trilobed, 3 mm long, 1.5 mm wide across the lobes, the apical lobe ovate with the apex rounded, the lateral lobes below the middle, erect, obtuse, oblique and antrorse, the disc with a pair of rounded calli within the margins at the bases of the lobes, the base truncate, hinged to the column-foot; **column** terete, 2 mm long, the foot short, the anther subapical, the stigma ventral.

COLOMBIA: Dept. of Antioquia: Medellín, epiphytic in cloud forest, Cerro Padre Amaya, alt. 2800 m, 22 Apr. 1983, *C. Luer, J. Luer, R. Escobar & M. Webb 8765* (Holotype: SEL); El Retiro, Monte de los Penagos above Colomborquídeas, alt. ca. 2700 m, 16 May 1993, *C. Luer 16914* (MO).

This tiny species from the nearby mountains above the metropolis of Medellín is closely related to the widely distributed and variable *T. pusilla*. From the latter it is distinguished by the minute clumps of overlapping, more or less prostrate leaves that obscure the ramicauls that are barely one millimeter long. The proportionately large, solitary flower, as large as or larger than a leaf, is borne a short distance above the leaves. The sepals are shortly acuminate, the petals are irregularly truncate, and the lobes of the lip occupy the lower half. The calli at the bases of the lobes are similar to those of *T. pusilla*.

Trichosalpinx wilhelmii Luer, sp. nov. Fig. 91.

Ety.: Named in honor of Dr. Sherman Wilhelm, formerly of Sarasota, Florida, co-discoverer of this species.

Species haec *T. durae* (Lindl.) Luer affinis, sed labello multiminore cum callis duobus mammilliformibus distinguitur.

Plant small, epiphytic, caespitose and more or less prolific; roots slender. Ramicauls erect, often 2-3 superposed, each 1.5-3 cm long, enclosed by 3-6 microscopically scabrous, lepanthiform sheaths with dilated, ciliate ostia. **Leaf** erect, coriaceous, gray-green with 3 purple stripes, elliptical to broadly elliptical, obtuse, 7-10 mm long, 4-7 mm wide, contracted below into a petiole 1 mm long. **Inflorescence** a loose, subsecund, simultaneously several-flowered raceme, 15-25 mm long including the filiform peduncle 5-10 mm long, from near the apex of the ramicaul; floral bracts ciliate, 0.75 mm long; pedicels 1 mm

long; ovary 0.4 mm long; **sepals** yellow, glabrous, tall-carinate, thickened toward the apices, the dorsal sepal ovate, concave, acute, slightly acuminate, 2.5 mm long, 1-1.25 mm wide, 3-veined, the lateral sepals barely connate basally, narrowly ovate, oblique, acute, 2.5 mm long, 0.75 mm wide, 1-veined; **petals** colorless, translucent, oblong, 0.75 mm long, 0.3 mm wide, 1-veined, the apex obtuse to rounded, microscopically erose; **lip** yellow, fleshy, cellular glandular, ovoid, 0.75-0.9 mm long, 0.5-0.75 mm wide expanded, rounded and thick at the apex with the margins broadly rounded and erect in the lower two-thirds, the disc channeled centrally between a pair of mammillate calli above the middle, the base truncate, hinged to the column-foot; **column** terete, winged at the apex, 0.5 mm long, the anther apical, the stigma ventral.

ECUADOR: Prov. of Napo: Archidona, alt. 550 m, Spring 1983, *A. Hirtz 888* (Holotype: MO; Isotype: SEL); Guacamayo Range south of Baeza, alt. ca. 1000 m, 11 Aug. 1978, *C. Luer, J. Luer, A. Hirtz & A. Andreetta 3261* (SEL); Prov. of Pichincha: orange trees above Tinalandia, alt. 800 m, 16 Aug. 1975, *C. Luer, G. Luer & S. Wilhelm 532* (SEL).

This little species, found uncommonly on both sides of the Andes of Ecuador, closely resembles the frequent and variable *T. dura*-complex with which it is sympatric. The ramicauls of both species are prolific, but densely clumped plants are formed. The small leaves are similarly often striped with purple along the three veins. The racemes of both species are similar, those of *T. wilhelmii* being smaller with shorter bracts and pedicels. The small sepals are tall-carinate; the tiny petals are translucent with a microscopically erose, rounded apex; and the minute lip is cellular and fleshy. with erect, rounded sides, and a pair of central, mammillate calli.

Trichosalpinx yanganensis (Luer) Luer, Phytologia 54: 397, 1093. Fig. 92.

Bas.: *Pleurothallis yanganensis* Luer, Phytologia 49: 221, 1981.

Ety.: Named for the community of Yangana, near where the species was collected.

Plant small, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 2-4.5 cm long, enclosed by 2-6 closely appressed, microscopically ciliate, lepanthiform sheaths. **Leaf** erect, coriaceous, elliptical, subacute to obtuse, 12-25 mm long, 5-9.5 mm wide, contracted below into a petiole 1-3 mm long. **Inflorescence** a suberect, loose, secund, simultaneously few-flowered raceme 2-4.5 cm long including the peduncle ca. 1 cm long, from near the apex of a ramicaul; floral bracts 2.5 mm long; pedicels 1.5-2 mm long; ovary 0.75-1 mm long; **sepals** translucent yellow-orange with brown veins, glabrous, carinate, the dorsal sepal ovate, acute, deeply concave, 8-9 mm long, 4.5-5.5 mm wide, 3-veined, barely connate to the lateral sepals, the lateral sepals narrowly triangular, oblique, acute, 7-8 mm long, 1.5 mm wide, connate 3.5 mm, each 1-veined; **petals** translucent, oblong, rounded at the apex, 2.5-3 mm long, 1 mm wide, 1-veined; **lip** orange, suffused with brown, oblong-ovate, subtrilobed, 4 mm long, 2 mm wide across the lobes, the apical half oblong with the apex rounded, the lateral lobes low, thickened, broadly rounded, below the middle, the disc shallowly sulcate, featureless, the base truncate, hinged to the column-foot; **column** terete, 3 mm long, the anther subapical, the stigma ventral, the foot 1.5 mm long.

ECUADOR: Prov. of Loja: epiphytic in cloud forest south of Yangana toward Valladolid, alt. 2250 m, 11 May 1981, *C. Luer, J. Luer, J. Kuhn & D'Alessandro 6150* (Holotype: SEL); epiphytic southeast of Yangana toward army post, alt. 2400 m, 22 Mar. 1985, *C. Luer, J. Luer, A. Hirtz & W. Flores 10813* (MO).

This small species, related to *T. tenuis* and its allies, is known only from southern Ecuador. It is distinguished from them by the loose, few-flowered raceme of orange, brown-striped flowers, longer than the elliptical leaf. The dorsal sepal is deeply concave, much broader than the narrow, lateral sepals combined. The oblong petals are broadly rounded at the apex. The lip is thickened below the middle with low, broadly rounded lateral lobes. The disc is featureless.

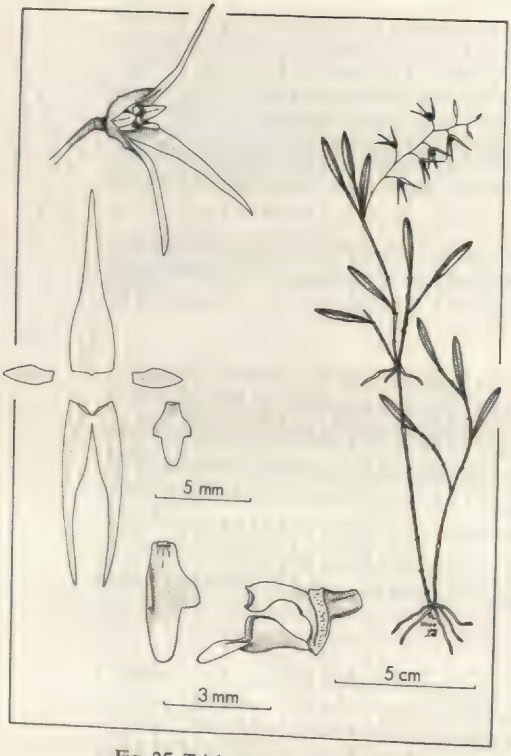

Fig. 25. Trichosalpinx acremona

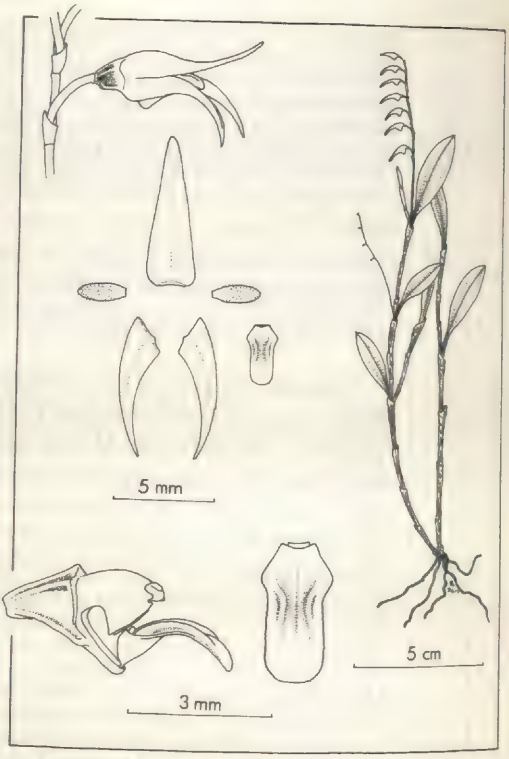

Fig. 26. Trichosalpinx alabastra

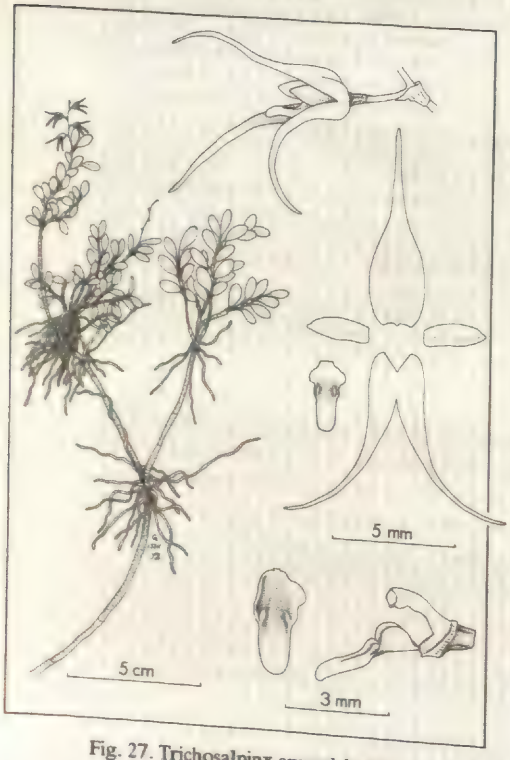

Fig. 27. Trichosalpinx amygdalodora

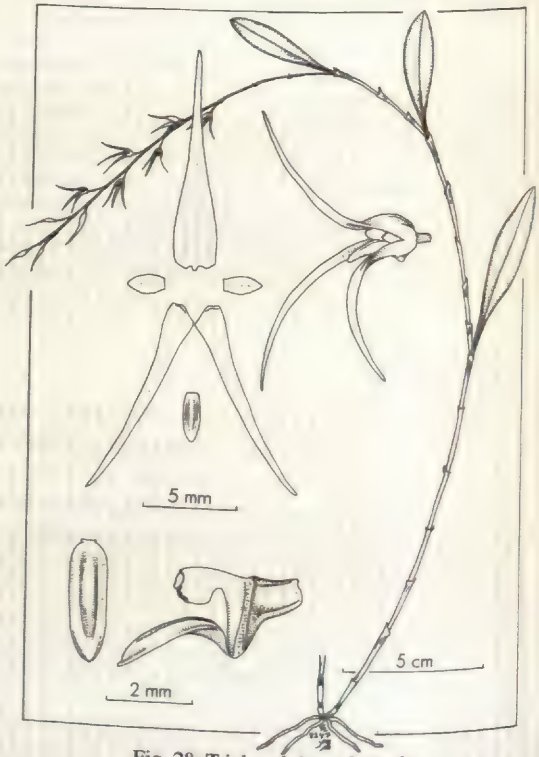

Fig. 28. Trichosalpinx arbuscula

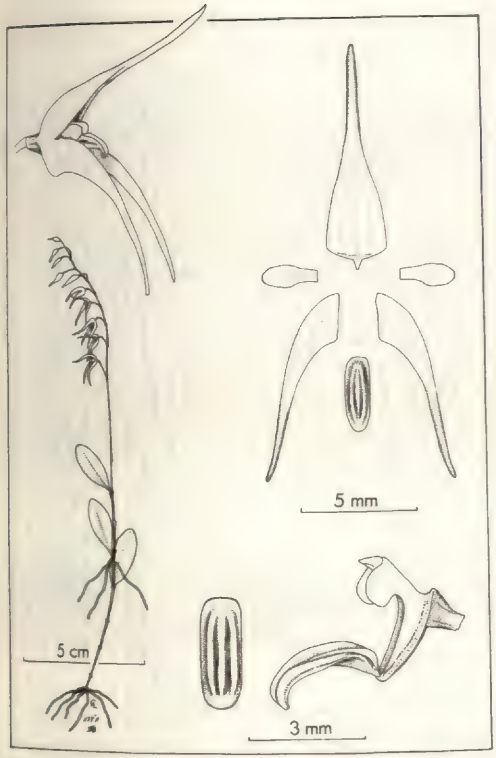

Fig. 29. Trichosalpinx arbuscula (T. moschata)

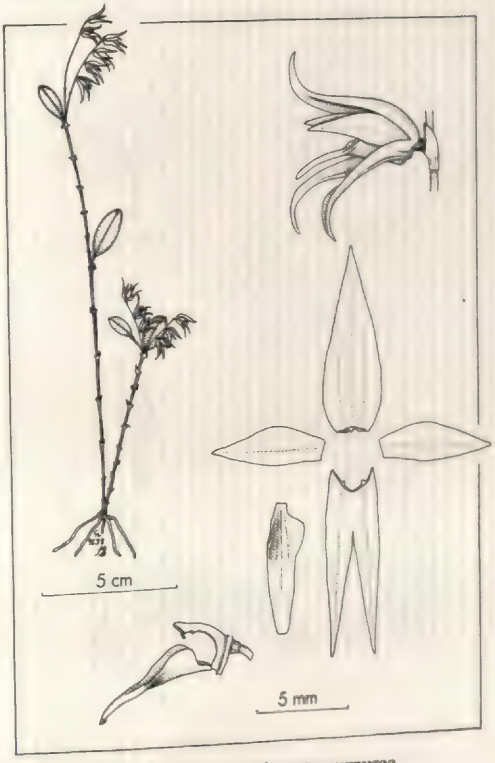

Fig. 30. Trichosalpinx atropurpurea

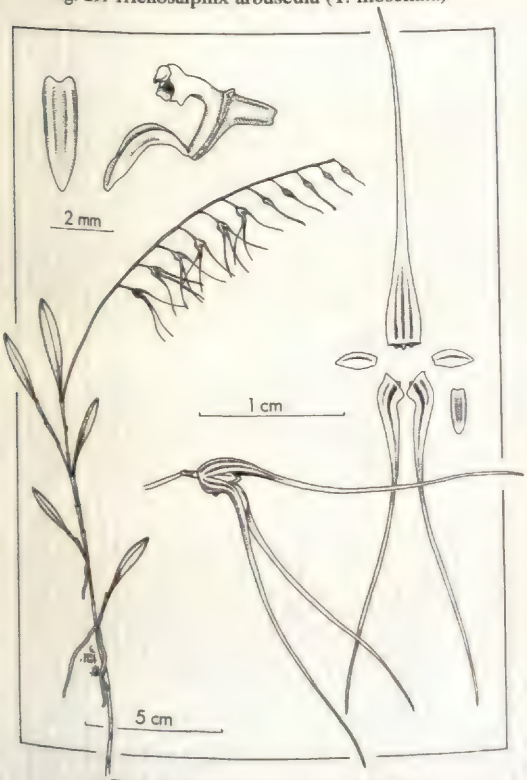

Fig. 31. Trichosalpinx barbelifera

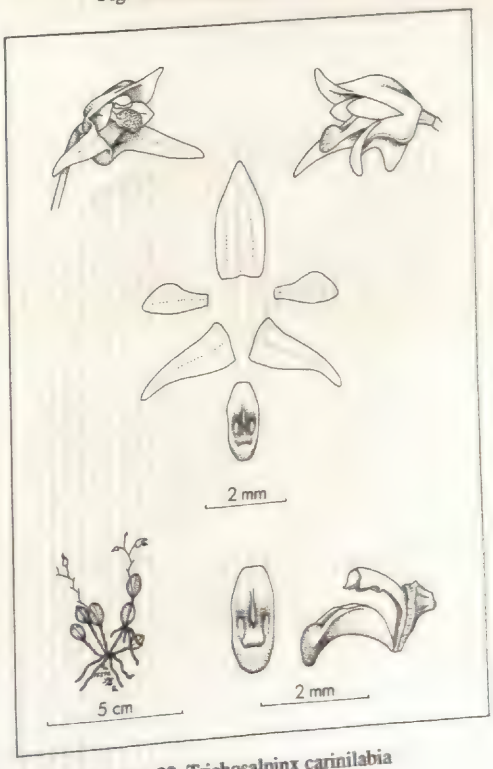

Fig. 32. Trichosalpinx carinilabia

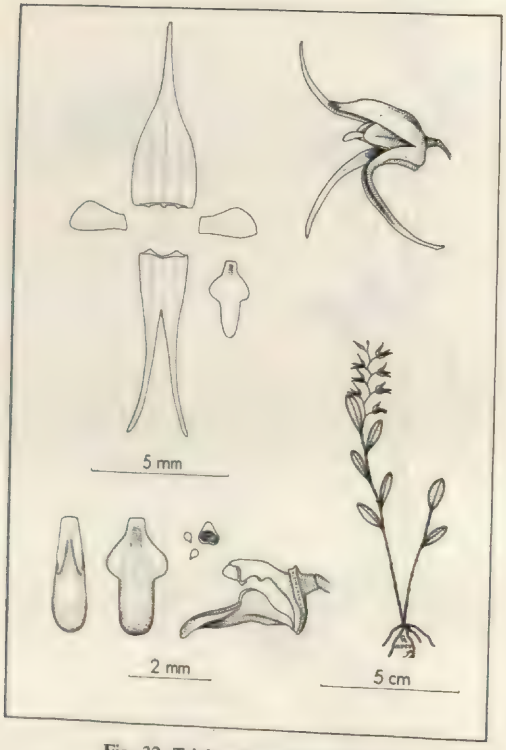

Fig. 33. Trichosalpinx cedralensis

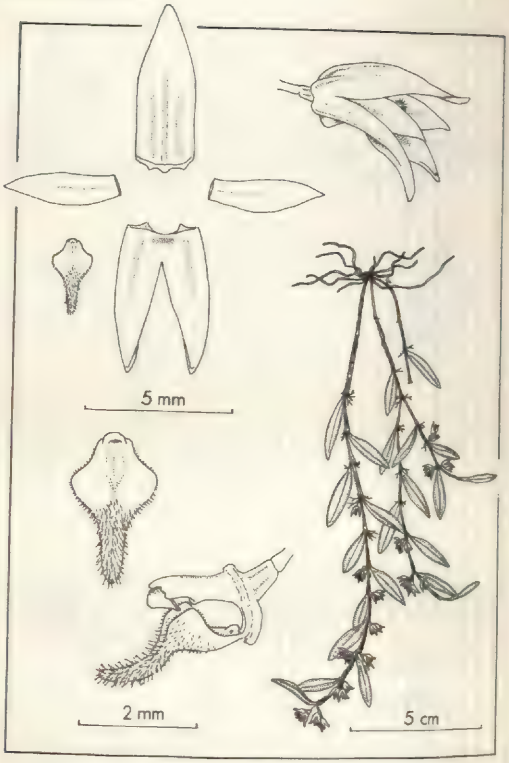

Fig. 34. Trichosalpinx chaetoglossa

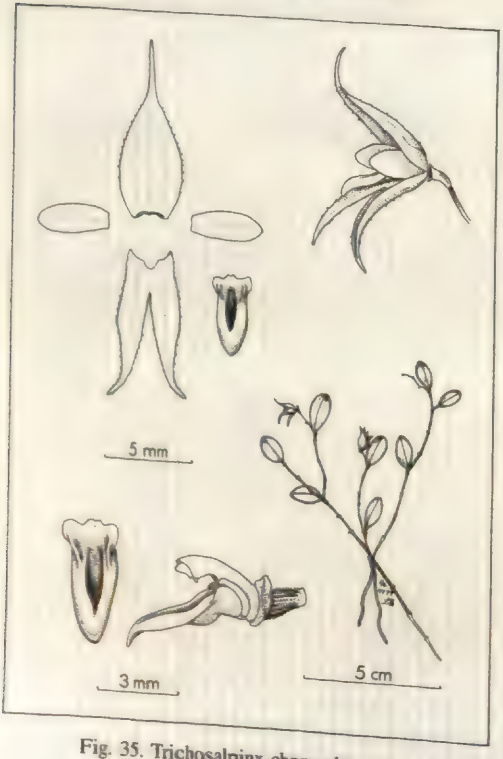

Fig. 35. Trichosalpinx chamaelepanthes

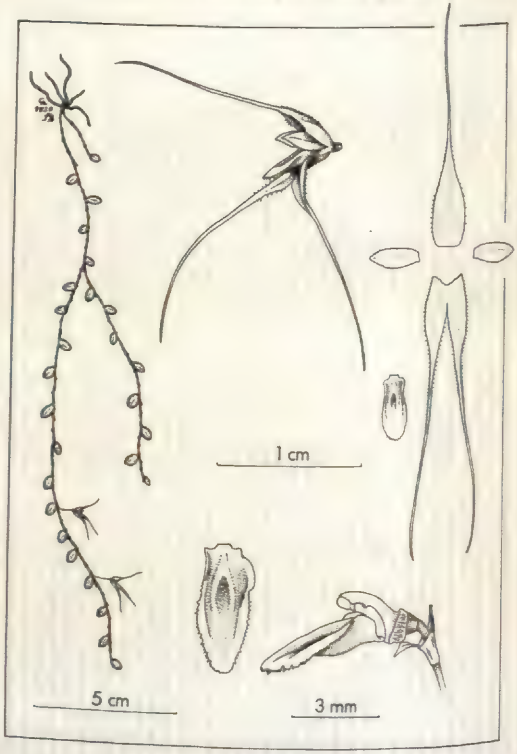

Fig. 36. Trichosalpinx chamaelepanthes

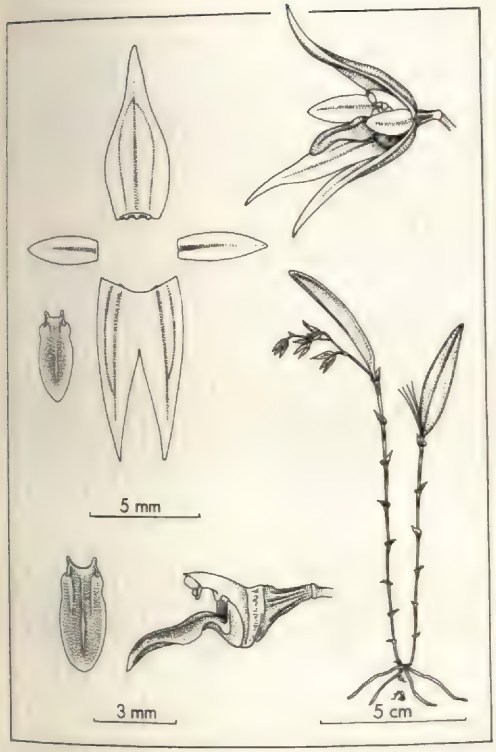

Fig. 37. Trichosalpinx costata

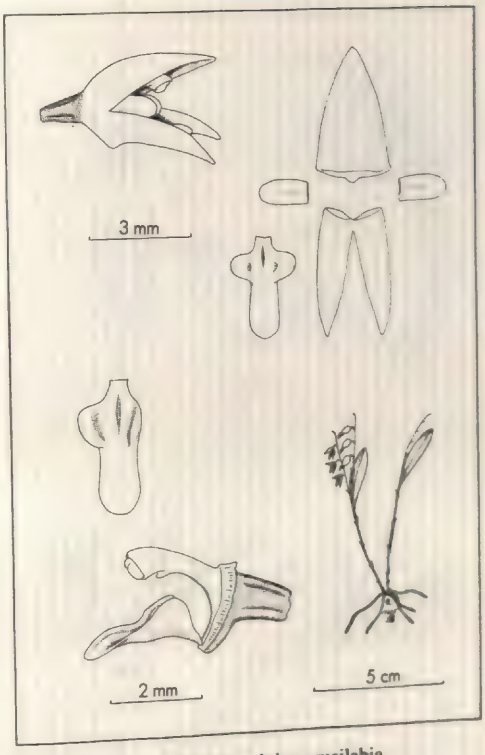

Fig. 38. Trichosalpinx crucilabia

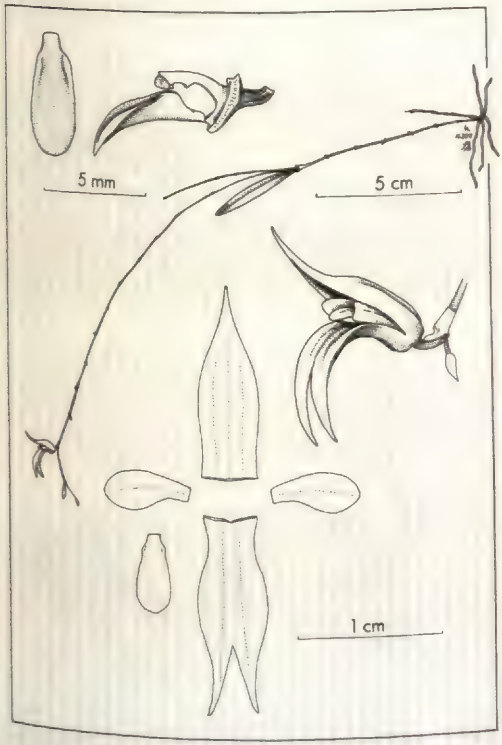

Fig. 39. Trichosalpinx dalstroemii Luer

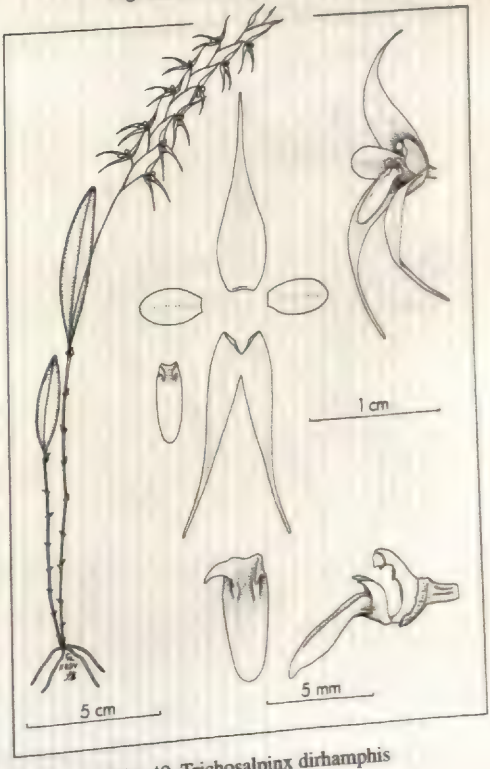

Fig. 40. Trichosalpinx dirhamphis

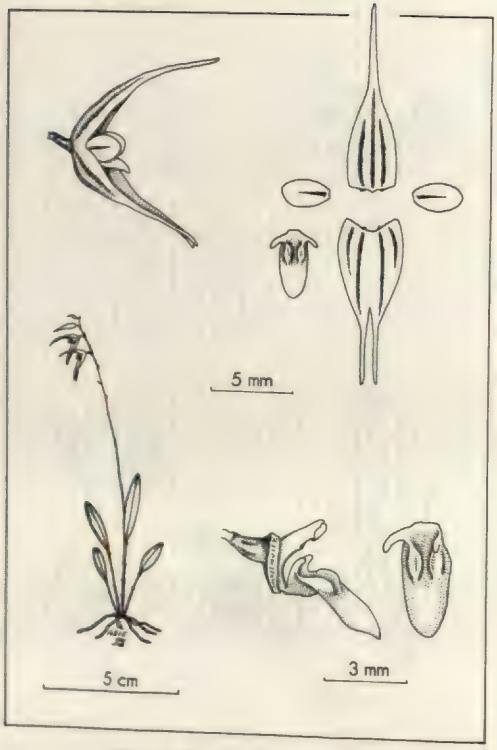

Fig. 41. Trichosalpinx dressleri

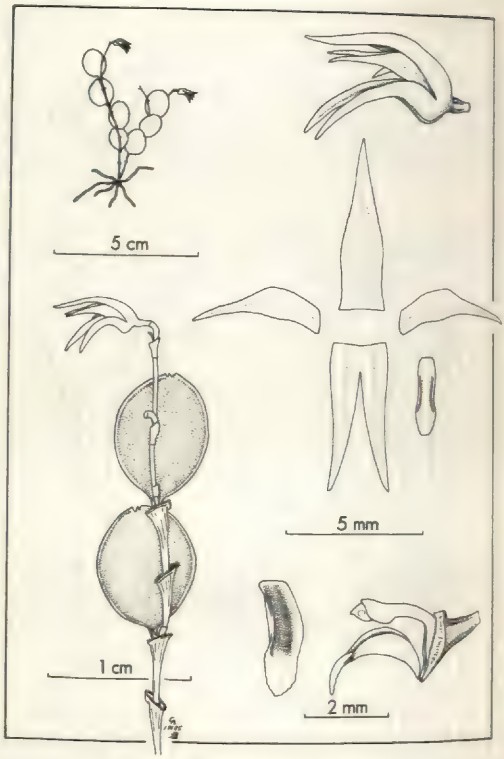

Fig. 42. Trichosalpinx drosoides

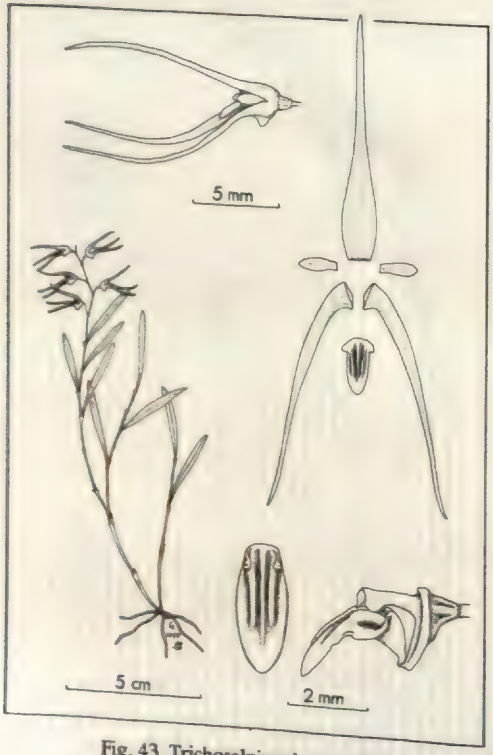

Fig. 43. Trichosalpinx dunstervillei

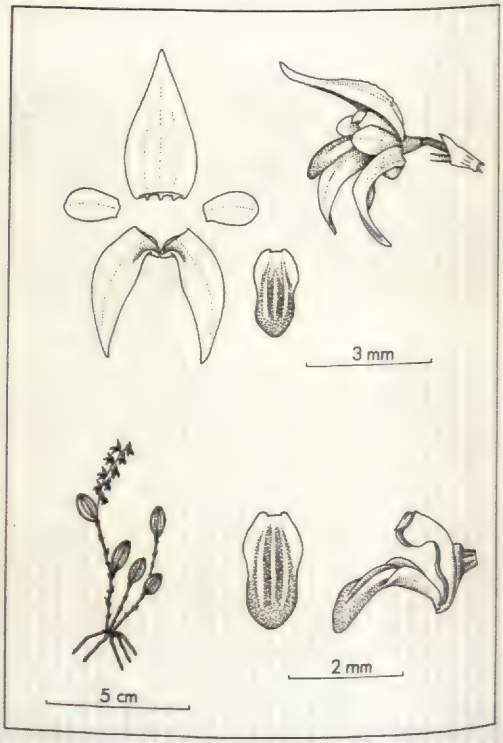

Fig. 44. Trichosalpinx dura

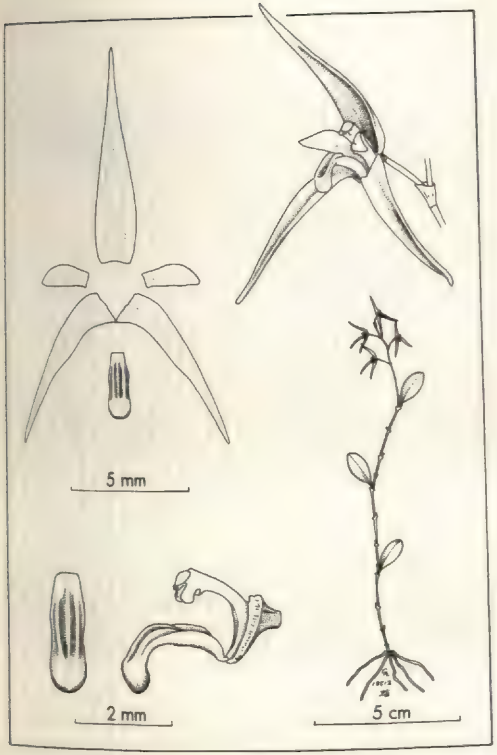

Fig. 45. Trichosalpinx dura

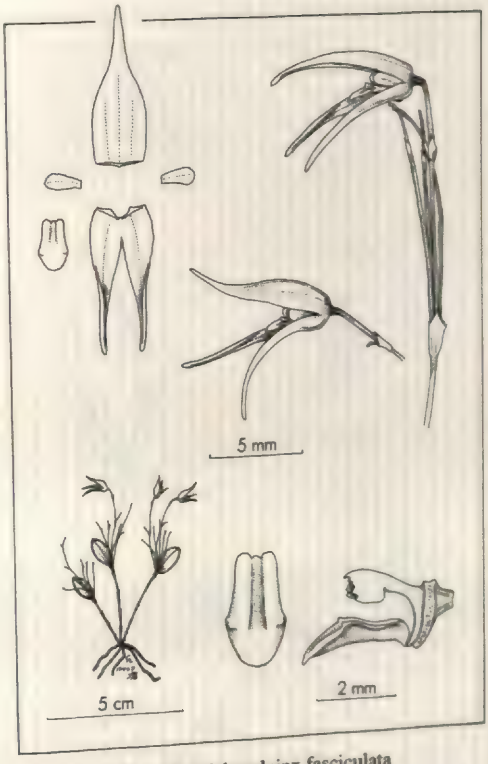

Fig. 46. Trichosalpinx fasciculata

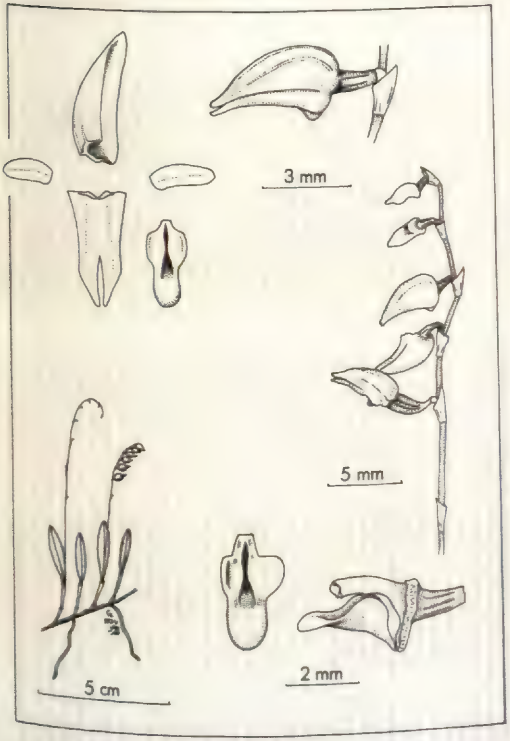

Fig. 47. Trichosalpinx fissa

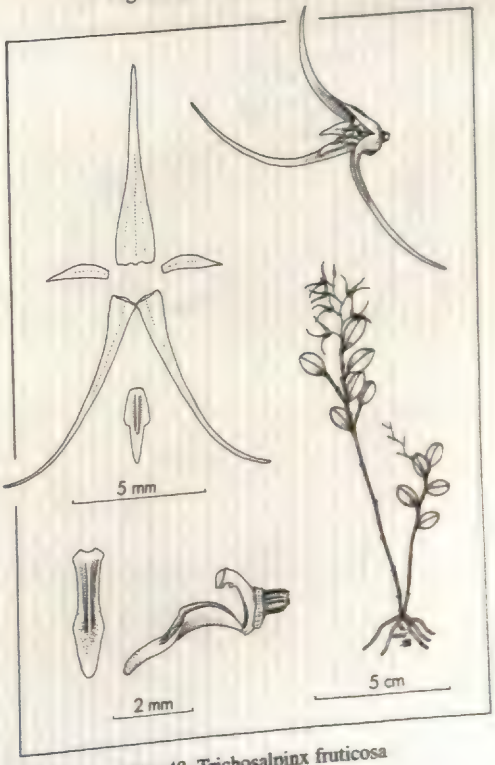

Fig. 48. Trichosalpinx fruticosa

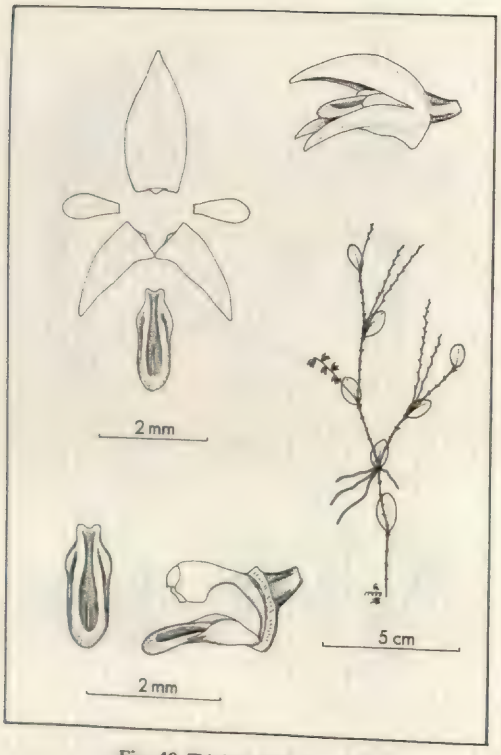

Fig. 49. Trichosalpinx gentryi

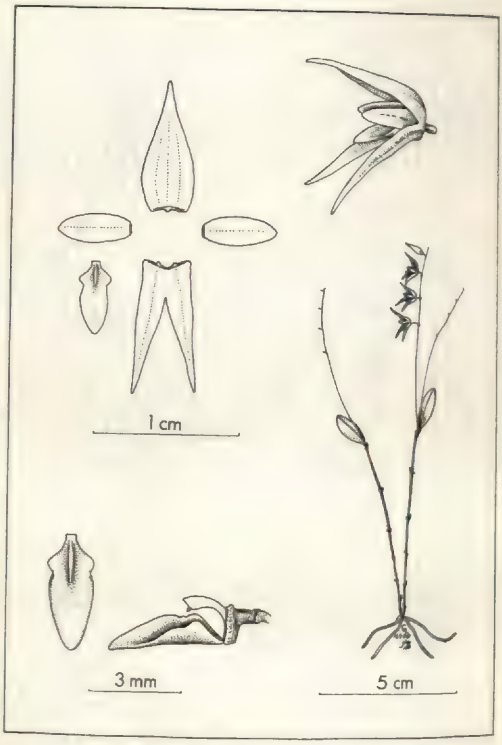

Fig. 50. Trichosalpinx hamiltonii

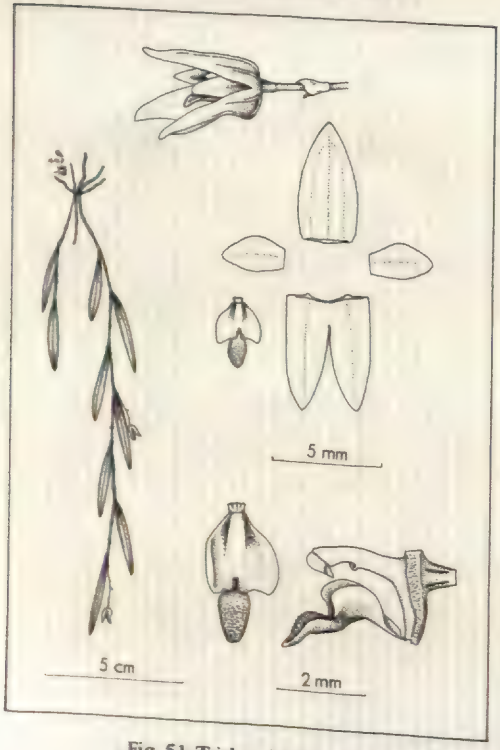

Fig. 51. Trichosalpinx hirtzii

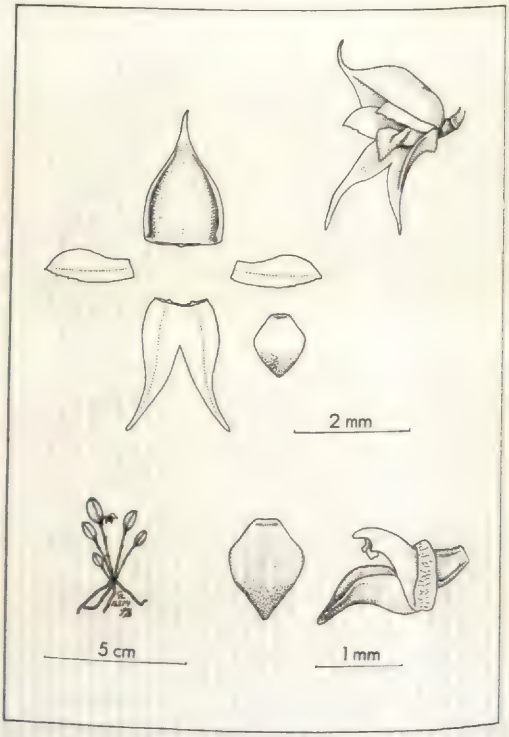

Fig. 52. Trichosalpinx inaequisepala

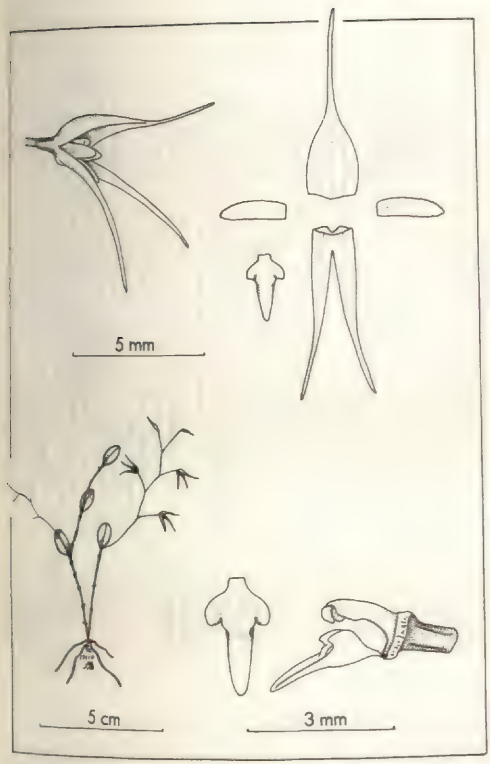

Fig. 53. Trichosalpinx intricata

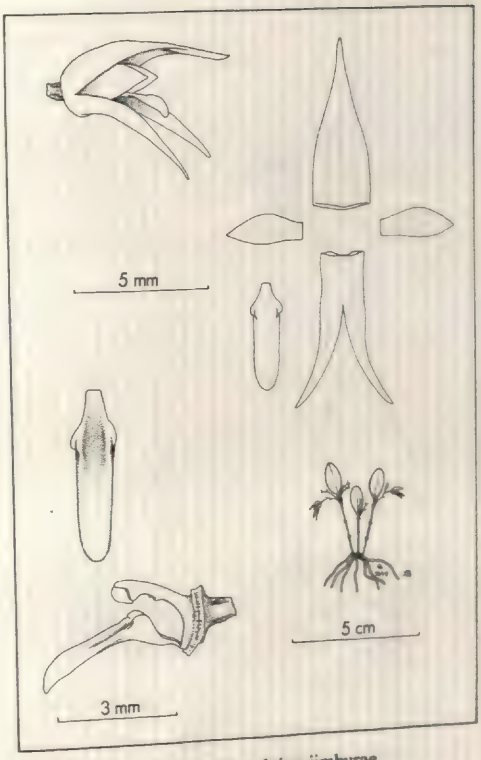

Fig. 54. Trichosalpinx jimburae

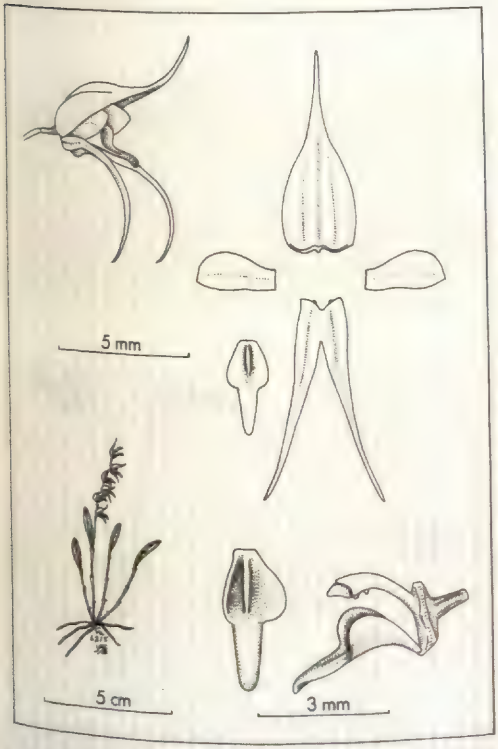

Fig. 55. Trichosalpinx lamellata

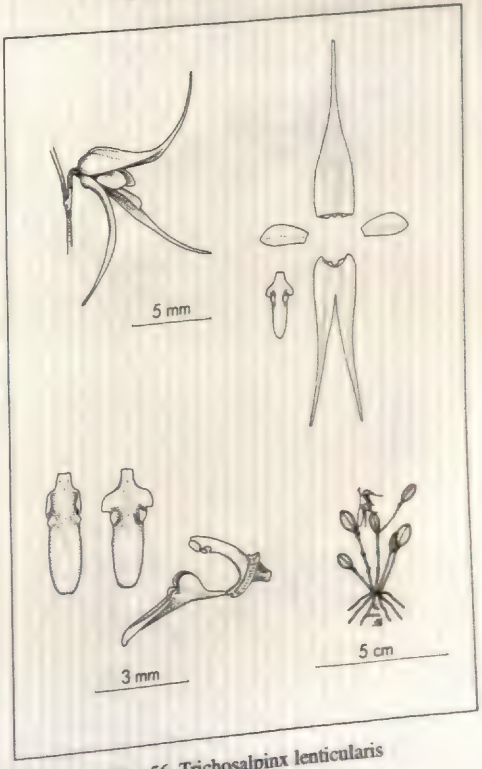

Fig. 56. Trichosalpinx lenticularis

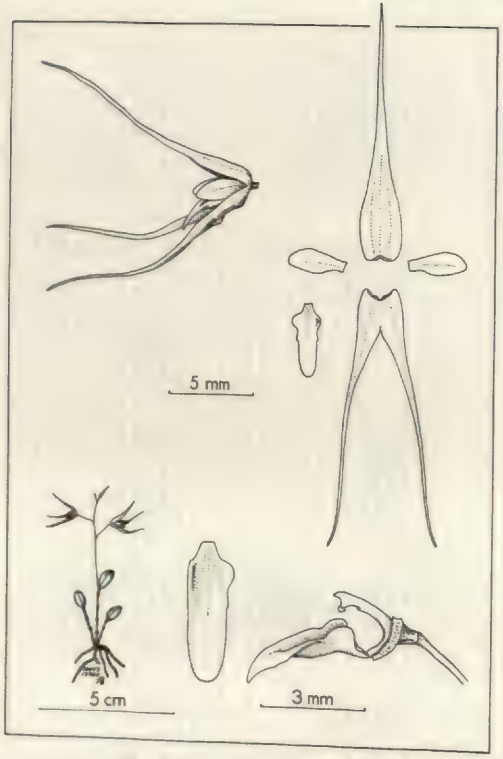

Fig. 57. Trichosalpinx ligulata

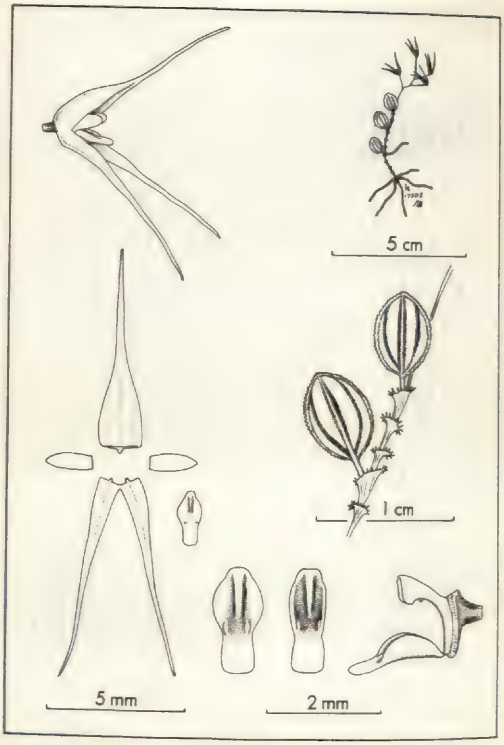

Fig. 58. Trichosalpinx macphersonii

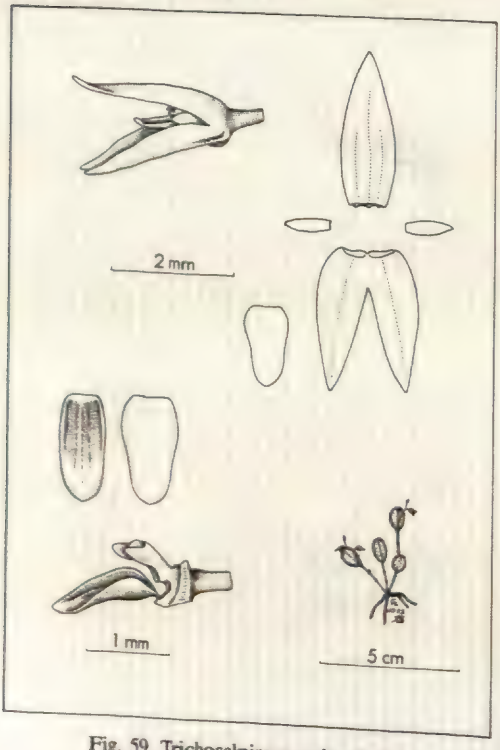

Fig. 59. Trichosalpinx membraniflora

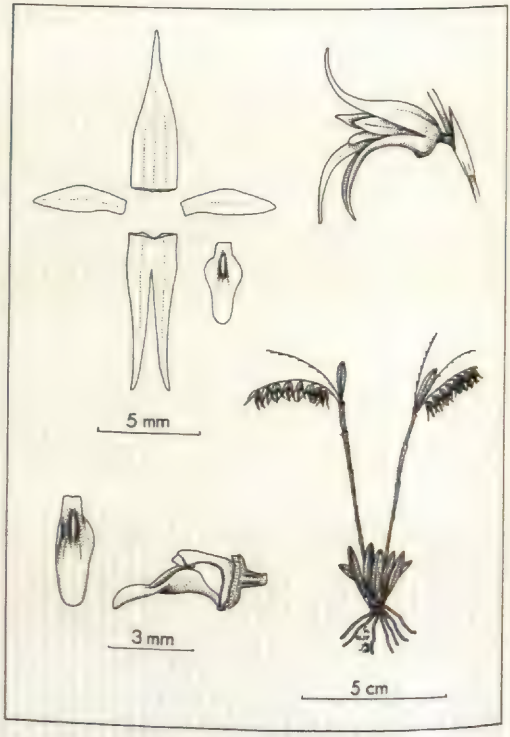

Fig. 60. Trichosalpinx metamorpha

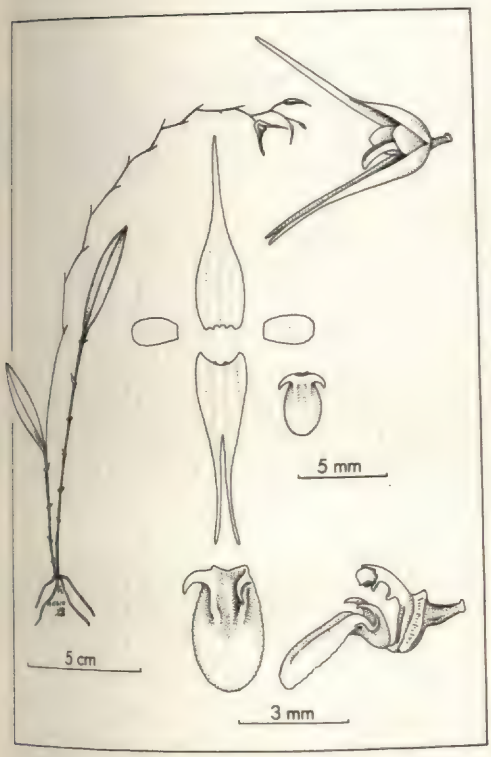

Fig. 61. Trichosalpinx montana

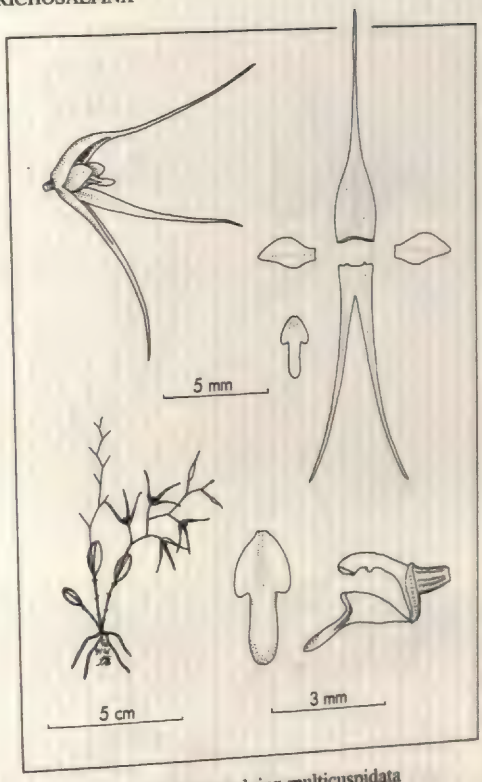

Fig. 62. Trichosalpinx multicuspidata

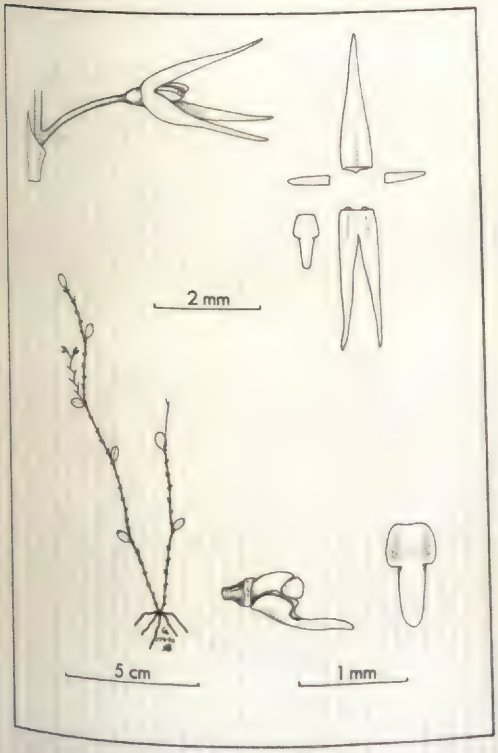

Fig. 63. Trichosalpinx nana

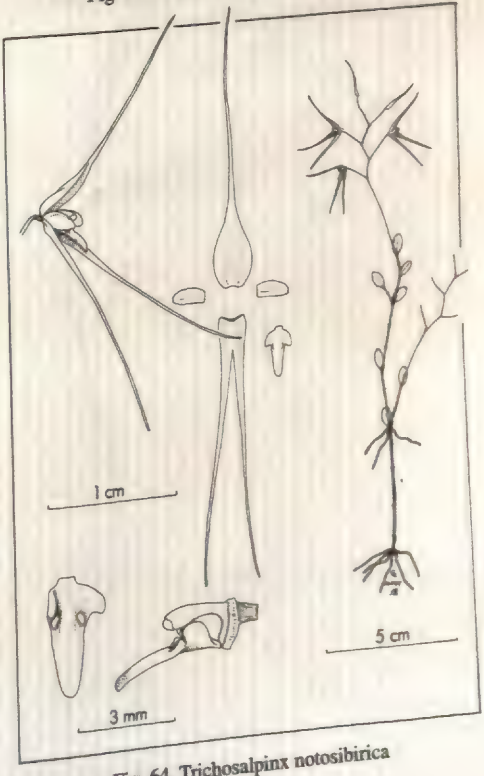

Fig. 64. Trichosalpinx notosibirica

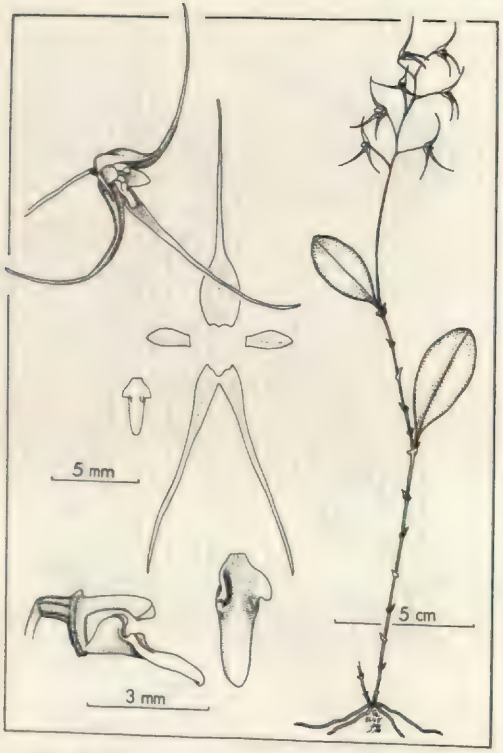

Fig. 65. Trichosalpinx notosibirica (T. mastophora)

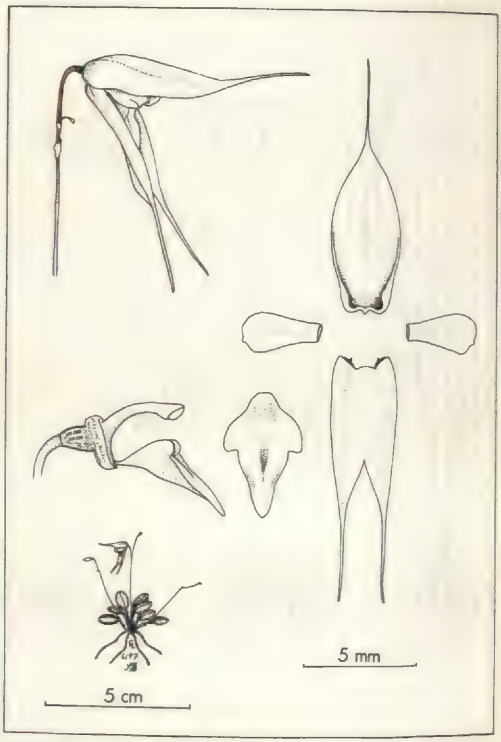

Fig. 66. Trichosalpinx nymphalis

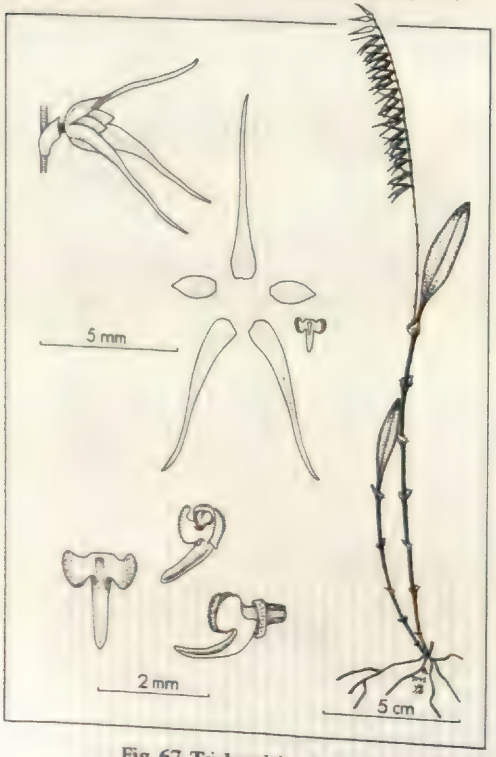

Fig. 67. Trichosalpinx otarion

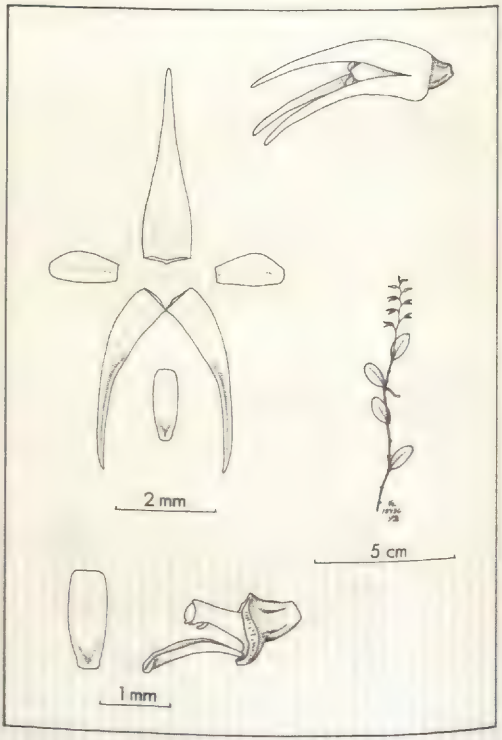

Fig. 68. Trichosalpinx parsonsii

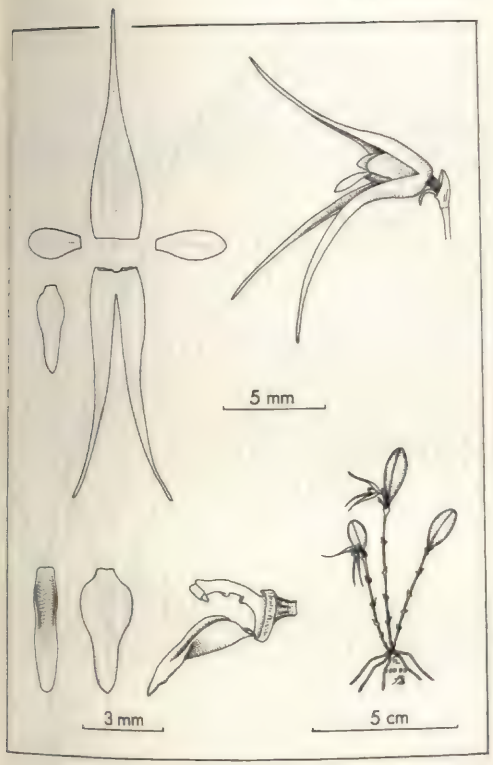

Fig. 69. Trichosalpinx pergrata

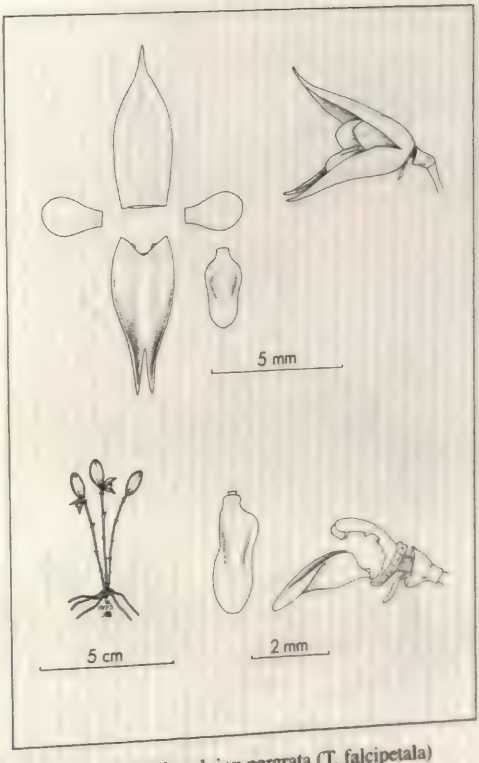

Fig. 70. Trichosalpinx pergrata (T. falcipetala)

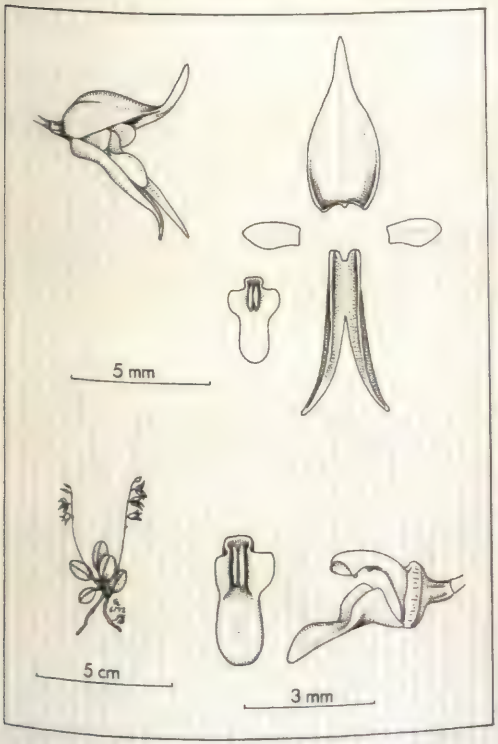

Fig. 71. Trichosalpinx pumila

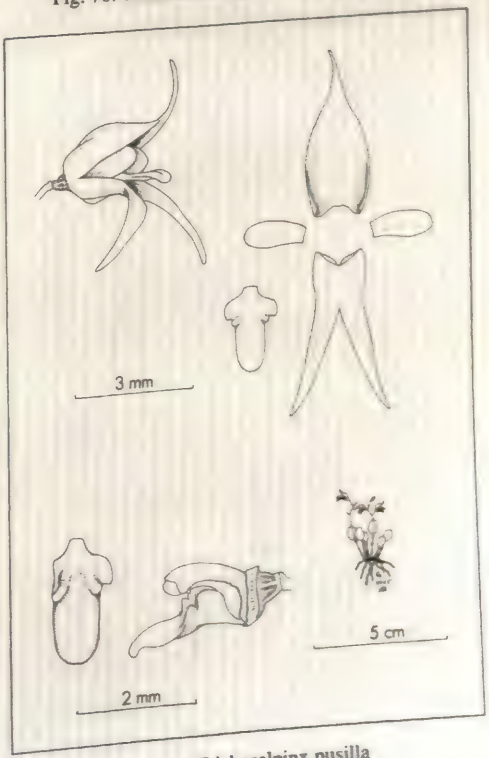

Fig. 72. Trichosalpinx pusilla

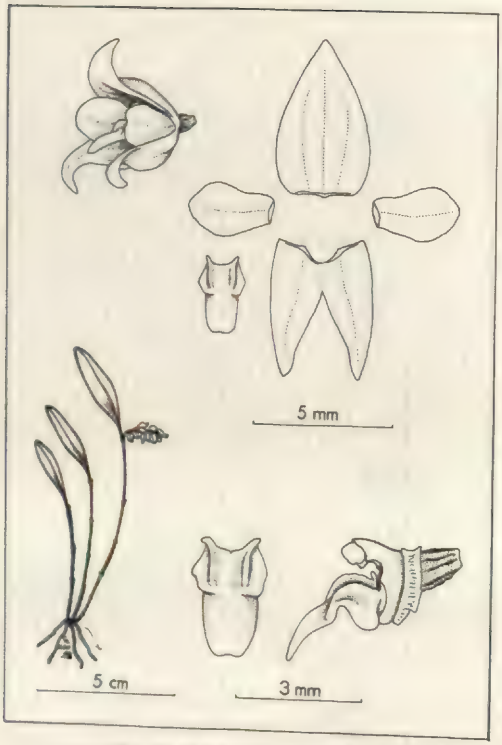

Fig. 73. Trichosalpinx quitensis

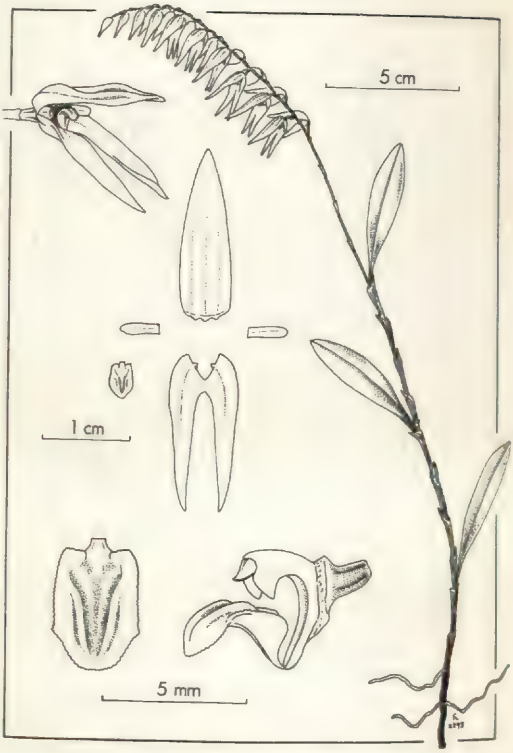

Fig. 74. Trichosalpinx robledorum

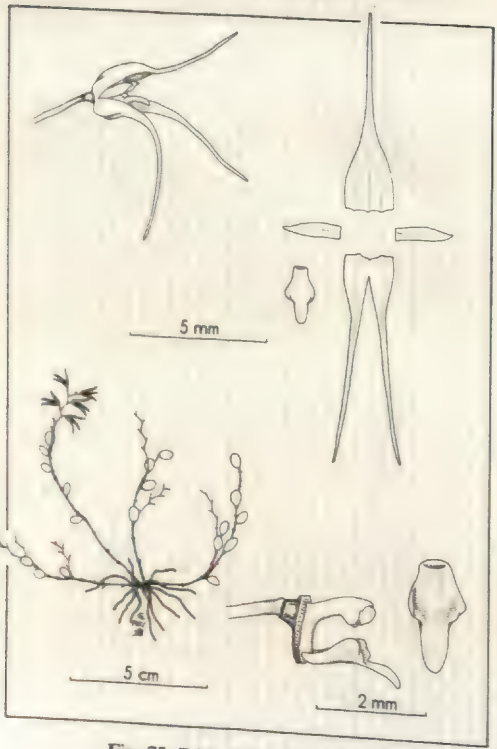

Fig. 75. Trichosalpinx scabridula

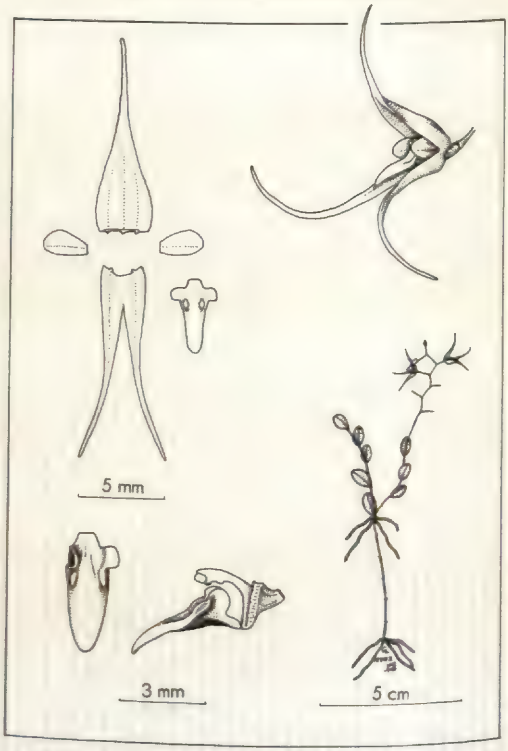

Fig. 76. Trichosalpinx scabridula

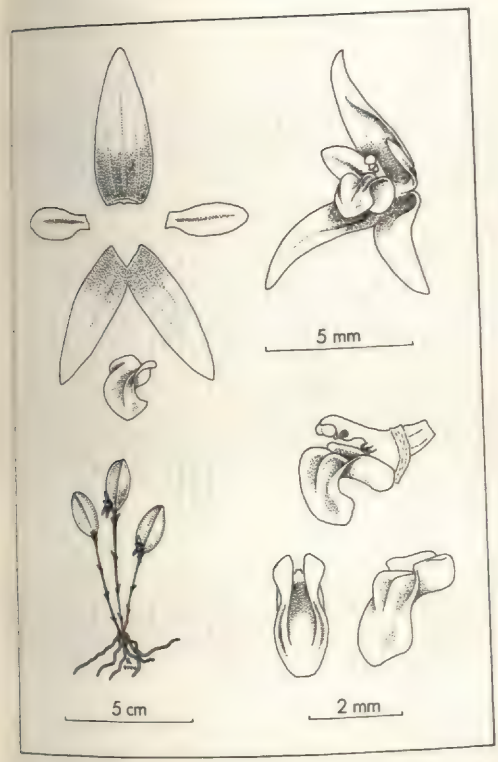

Fig. 77. Trichosalpinx semilunata

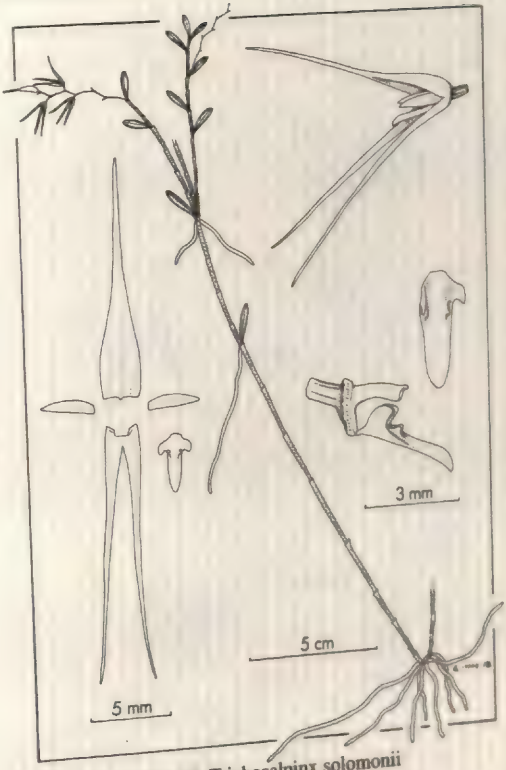

Fig. 78. Trichosalpinx solomonii

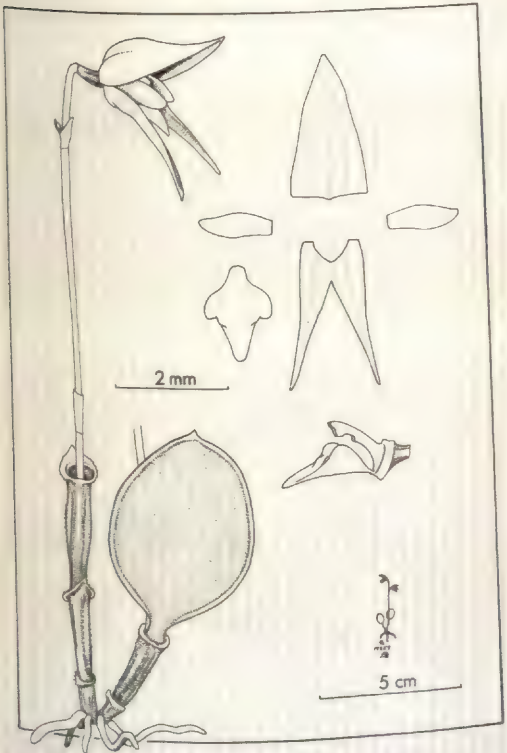

Fig. 79. Trichosalpinx steyermarkii

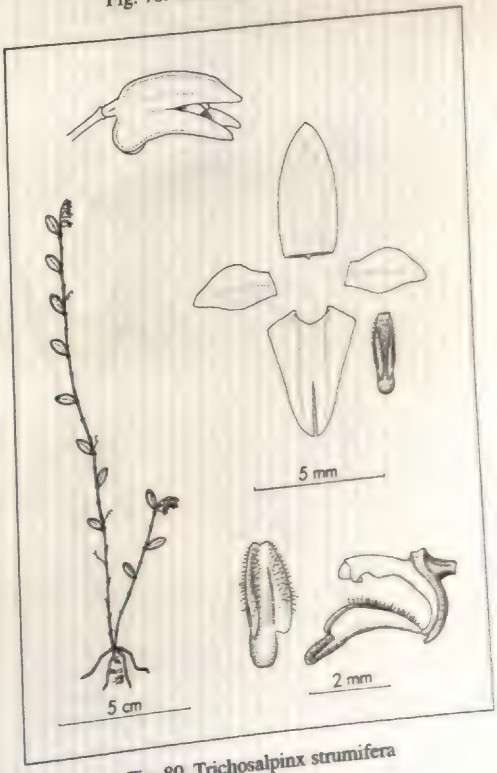

Fig. 80. Trichosalpinx strumifera

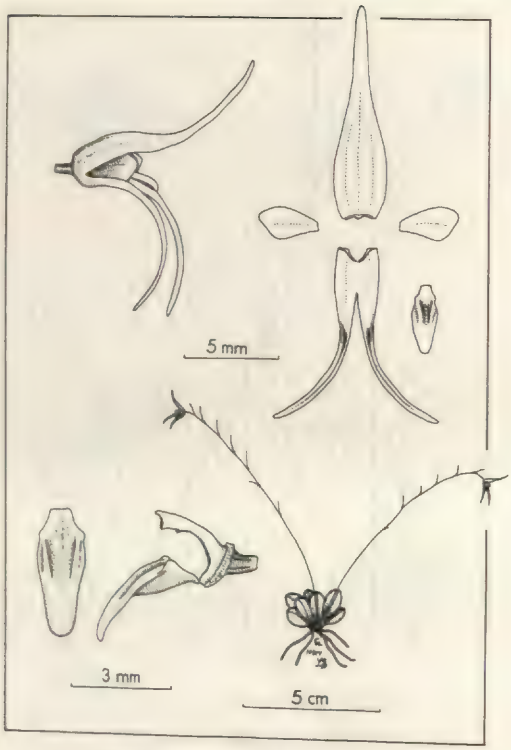

Fig. 81. Trichosalpinx systremmata

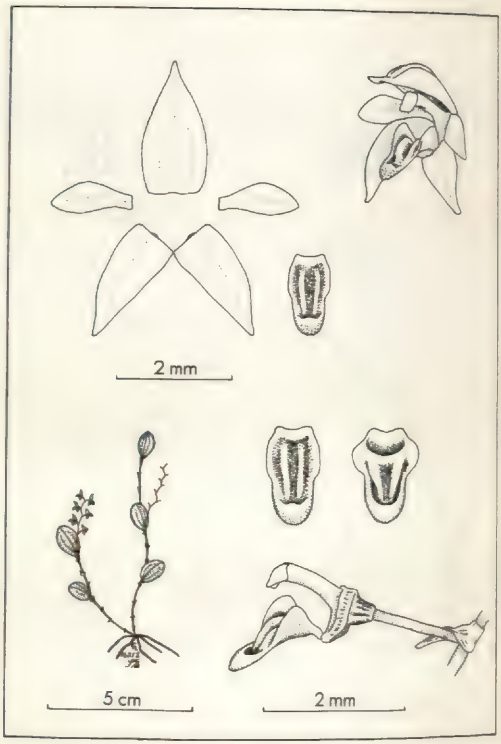

Fig. 82. Trichosalpinx tantilla

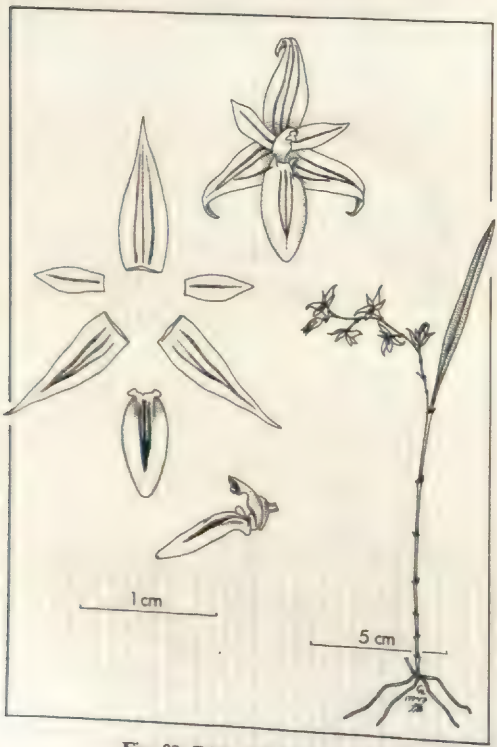

Fig. 83. Trichosalpinx teagueii

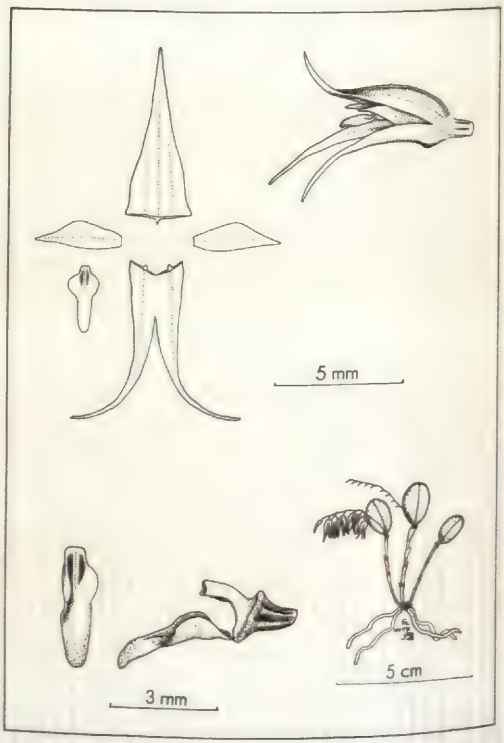

Fig. 84. Trichosalpinx tenuis

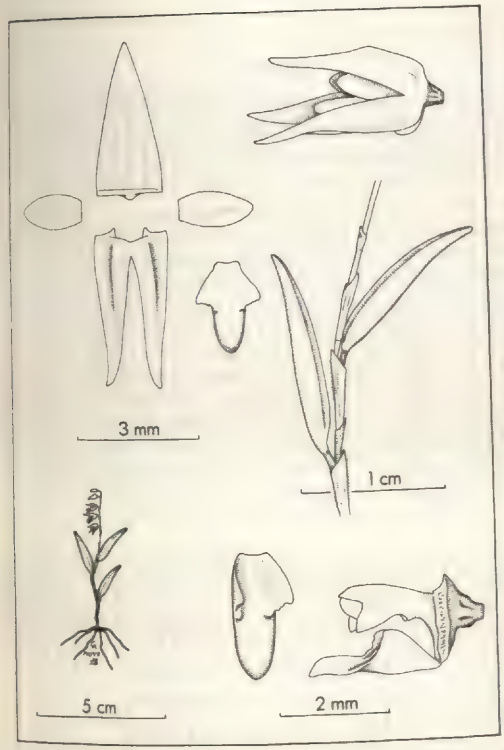

Fig. 85. Trichosalpinx teres

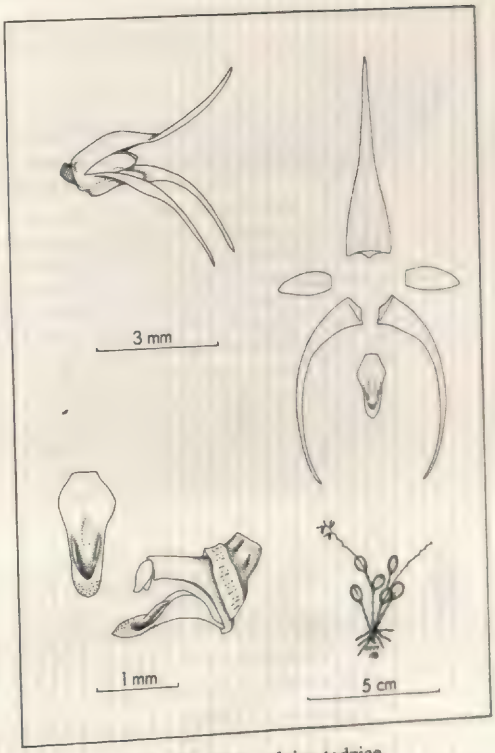

Fig. 86. Trichosalpinx todziae

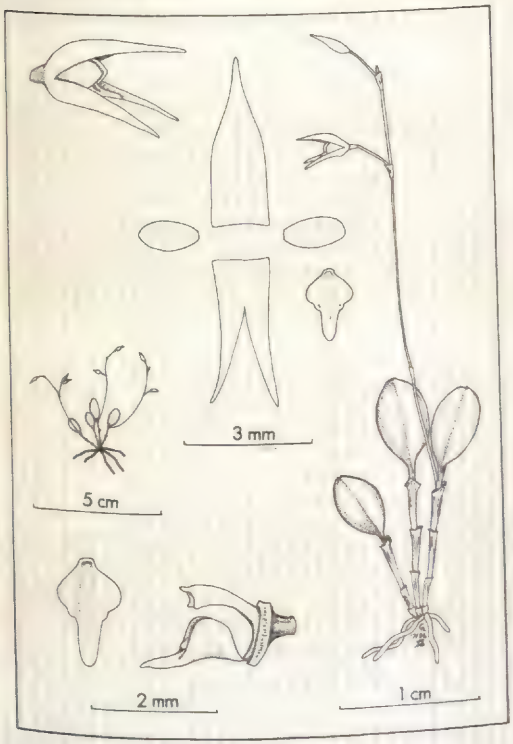

Fig. 87. Trichosalpinx trilobata

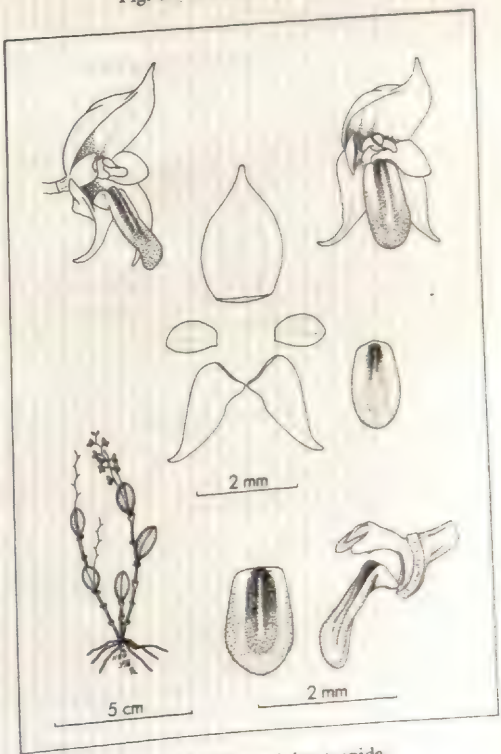

Fig. 88. Trichosalpinx tropida

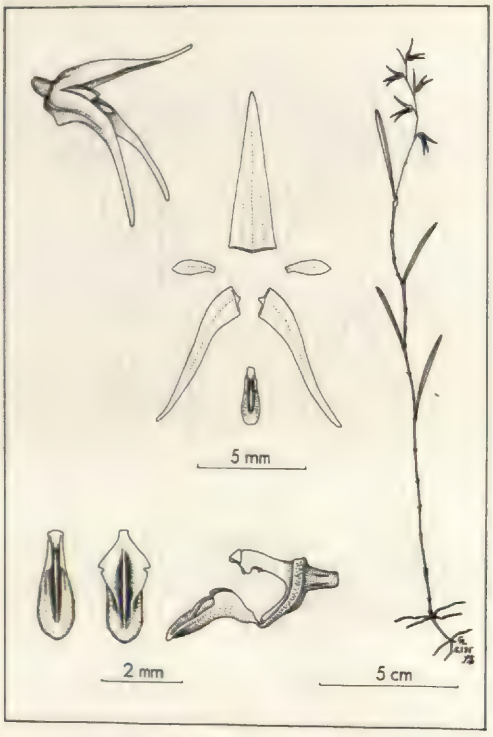

Fig. 89. Trichosalpinx vagans

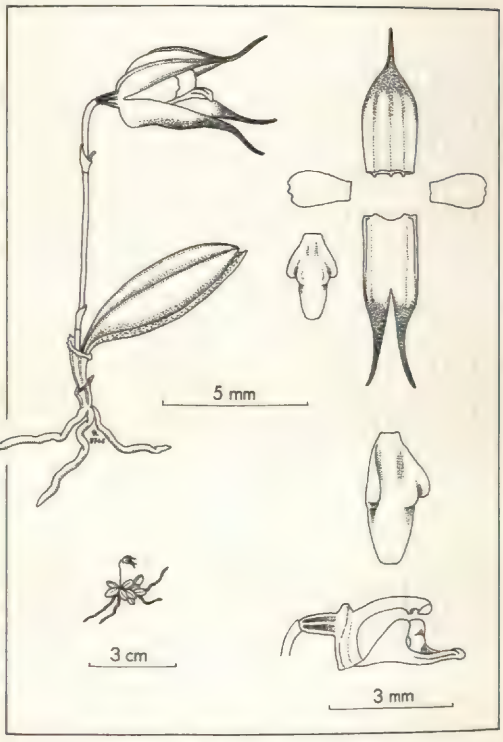

Fig. 90. Trichosalpinx webbiae

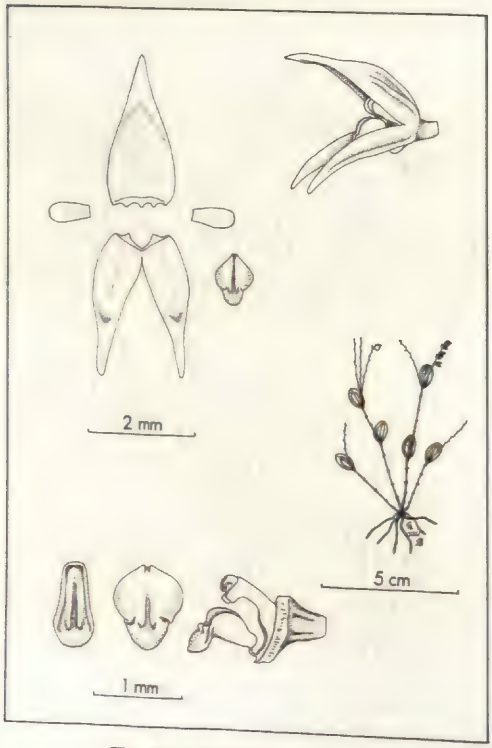

Fig. 91. Trichosalpinx wilhelmii

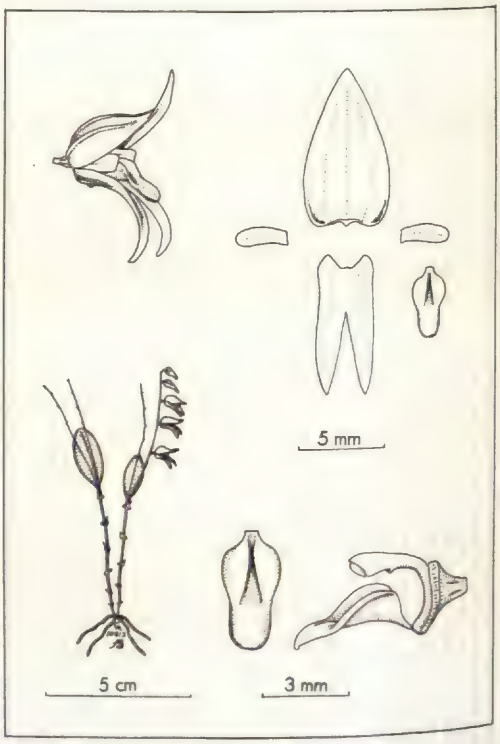

Fig. 92. Trichosalpinx yanganensis

SUBGENUS *PSEUDOLEPANTHES*

Trichosalpinx bricenoënsis Luer & Escobar, sp. nov. Fig. 93.

Ety.: Named for the community of Briceño near where the species is apparently endemic.

Species haec *T. pseudolepanthes* (Luer & Escobar) Luer similis, sed ovario longispiculato, petalis latioribus cum margine superiore basali angulato et labello breviore latioreque differt.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect, comparatively stout, 1.5-2.5 cm long, enclosed by 4-5 densely short-ciliate, lepanthiform sheaths. **Leaf** erect, coriaceous, suffused with purple beneath, broadly elliptical, subacute to obtuse, apiculate, 14-18 mm long, 9-11 mm wide, the base contracted into a petiole ca. 2 mm long. **Inflorescence** a strict, loose, successively many-flowered raceme, up to 13 cm long, borne by a filiform, sparsely spiculate peduncle 1-2 cm long, from near the apex of the ramicaul; floral bracts spiculate, acuminate, 3 mm long; pedicels 1 mm long; ovary long-spiculate, 1 mm long; **sepals** yellow-white or purple, long-spiculate extemally, the dorsal sepal ovate, subacute, concave, 3.25 mm long, 2 mm wide expanded, 3-veined, free from the lateral sepals, the lateral sepals free, ovate, oblique, acute, concave, 2.8 mm long, 1.5 mm wide, 1-veined; **petals** purple, ovate, acute, oblique, 2.5 mm long, 1.2 mm wide; **lip** purple, fleshy, ovoid, 2.25 mm long, 1.5 mm wide, the apex obtuse, with the margins minutely crenate, the disc filled with a prominent, erect, rounded, papillose callus, the base broadly truncate, smooth, fixed to the base of the column; **column** purple, erect, stout, terete, 1 mm long, the anther exposed on the front surface of the erect gynostemium, the stigma ventral, but facing forward on the erect column.

COLOMBIA: Dept. of Antioquia: Munic. of Yarumal, road to Briceño, Quebrada El Oro, alt. 1850 m, 16 Mar. 1989, *C. Luer, J. Luer, W. Teague & S. Dalström 14196* (Holotype: MO, Isotype: JAUM).

This species, apparently restricted to a small, area in the Western Cordillera of Colombia, is most closely allied to the widely distributed *T. pseudolepanthes*. It is distinguished from the latter by the long-spiculate ovary, instead of glabrous; much broader petals with a basal angle on the upper margin; and a shorter, broader lip.

Trichosalpinx calceolaris Luer & Escobar, sp. nov. Fig. 94.

Ety.: From the Latin *calceolaris*, "like a shoe," in allusion to the appearance of the lip.

Planta parva, foliis late ellipticis ramicaulibus brevioribus, vaginis longiciliatis, sepalis lateralibus in synsepalum ovatum connatis, petalis linearibus acutis et labelli callo lato alto oblongo distinguitur.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 1.5-2.5 cm long, enclosed by 4 long-ciliate, lepanthiform sheaths. **Leaf** erect, coriaceous, suffused with purple beneath, elliptical, 12-18 mm long including a petiole 2-3 mm long, 7.5-9.5 mm wide, the apex obtuse to rounded, apiculate, the base contracted into the petiole. **Inflorescence** a substrict, loose, successively several-flowered raceme, up to 4 cm long, borne by a filiform, spiculate peduncle 1-1.5 cm long, from near the apex of the ramicaul; floral bracts acuminate, spiculate, 2 mm long; pedicels 0.5 mm long; ovary long-spiculate, 1 mm long; **sepals** white, sparsely long-spiculate extemally, the dorsal sepal narrowly ovate, acute, concave, 4.5 mm long, 1.5 mm wide unexpanded, 3-veined, free from the lateral sepals, the lateral sepals connate into an ovate, acute, concave synsepal, 4 mm long, 2.2 mm wide, 2-veined; **petals** purple, narrowly linear, acute, 4.5 mm long, 0.5 mm wide, 1-veined; **lip** purple, fleshy, ovoid, 2.5 mm long, 1 mm wide, the apex acute, the margins minutely crenulate, the disc with a prominent, erect, oblong callus, wider than the blade, papillose on the front surface, the base smooth, concave, truncate, inflexibly attached to the base of the column; **column** purple, erect, stout, terete, 1 mm long, the anther exposed on the ventral surface of the erect gynostemium, the stigma ventral.

COLOMBIA: Dept. of Antioquia: Munic. of Urrao, Pabón, collected by X. Zapata, Nov. 1992, flowered in cultivation at Colomborquídeas, 5 May 1993, *C. Luer 16723* (Holotype: MO); between Urrao and Carmen de Atrato, collected by Juan Philipe Posada, Aug. 1993, flowered in cultivation at Colomborquídeas, May 1995, *C. Luer 17592* (MO); north of the pass between Urrao and Carmen de Atrato, alt. 2700 m, 30 May 1995, *C. Luer, J. Luer, R. Escobar et al. 17634, 17652* (MO).

This species, apparently endemic in a small area around a wet, windy pass in the Western Cordillera of Colombia, is closely allied to *T. pseudolepanthes*. Vegetatively, the two species are very similar. The flowers are also similar, but the con-

nate lateral sepals, and the narrowly linear, outstretched petals of *T. calceolaris* are distinctive. The lips of the two species are also similar, but the callus of *T. calceolaris* is taller and broader than the blade. The callus of *T. pseudolepanthes* is smaller and not as wide as the blade. The lip of *T. calceolaris* has the appearance of a tiny, warty, slipper.

Trichosalpinx decorata Luer & Escobar, sp. nov. Fig. 95.

Ety.: From the Latin *decoratus*, "decorated," referring to the sparsely fimbriate petals.

Planta parva, foliis late ellipticis ramicaulibus brevioribus, vaginis breviciliatis, sepalis lateralibus in synsepalum ovatum connatis, petalis anguste ovatis marginibus sparsim longispiculatis distinguitur.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 15-17 mm long, enclosed by 4 shortly ciliate, lepanthiform sheaths. **Leaf** erect, coriaceous, elliptical, 13-15 mm long including a petiole 2-3 mm long, 6.5-7.5 mm wide, the apex obtuse to rounded, apiculate, the base contracted into the petiole. **Inflorescence** a lightly flexuous, loose, successively several-flowered raceme, up to 4.5 cm long, borne by a filiform peduncle 1-1.5 cm long, from near the apex of the ramicaul; floral bracts acuminate, spiculate, 1 mm long; pedicels 0.5 mm long; ovary glabrous, 1 mm long; **sepals** yellow-green, sparsely long-spiculate externally, the dorsal sepal narrowly ovate, acute, concave on the lower two thirds, 4.5 mm long, 1.5 mm wide unexpanded, 3-veined, free from the lateral sepals, the lateral sepals connate into an ovate, acute, concave synsepal, 4 mm long, 2 mm wide, 2-veined; **petals** yellow-green, suffused with purple on the basal third, oblong, acute, 4 mm long, 0.8 mm wide, 1-veined, with the margins sparsely long-spiculate; **lip** yellow with the callus purple, fleshy, ovoid, 2.25 mm long, 1.4 mm wide, the apex obtuse, the margins minutely crenulate, the disc with a prominent, erect, subpyramidal callus, papillose on the front surface, the base smooth, concave, broadly truncate, inflexibly attached to the base of the column; **column** yellow-green, erect, stout, terete, 1 mm long, the anther exposed on the front surface of the erect gynostemium, the stigma ventral.

COLOMBIA: Dept. of Valle del Cauca: epiphytic in cloud forest above San José del Palmar, Alto de Los Galápagos, alt. 2100 m, collected by A. De Wilde, flowered in cultivation above Pereira, 10 May 1993, *C. Luer 16738* (Holotype: MO). Dept. of Chocó: above San José del Palmar, Cerro del Torrá, alt. 1920 m, 8 Jan. 1984, *F. A. Silverstone-Sopkin, N. Paz, A. Duque & H. Bayona 1637, 1640* (CUVC, MO).

This species is apparently endemic in a small area of the Western Cordillera of Colombia. It is closely allied to *T. pseudolepanthes*. Vegetatively, the two species are very similar. The flowers are also similar, but the connate lateral sepals, and the sparsely long-spiculate, outstretched petals are distinctive. The lip is basically the same.

Trichosalpinx ectopa Luer & Escobar, sp. nov. Fig. 96.

Ety.: From the Greek *ectopos*, "strange," referring to unusual morphological features.

Planta parva, foliis late ellipticis ramicaulibus plus minusve aequilongis, vaginis lepanthiformibus, sepalis ovatis liberis, petalis carnosis ellipticis cum dente basali, et labelli callo verrucoso infra medium concavo laevi distinguitur.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 5-15 mm long, enclosed by 2-3 minutely ciliate, lepanthiform sheaths. **Leaf** erect, coriaceous, broadly elliptical, 9-17 mm long, 5-8 mm wide, the apex obtuse to rounded, apiculate, the base cuneate into a petiole 1 mm long. **Inflorescence** a strict, loose, successively many-flowered raceme, up to 6 cm long, borne by a filiform, spiculate peduncle 10-15 mm long, from near the apex of the ramicaul; floral bracts spiculate, 1 mm long; pedicels 1 mm long; ovary sparsely spiculate, 0.8 mm long; **sepals** translucent orange, spiculate externally, the dorsal sepal ovate, subacute, concave, 2.5 mm long, 1.75 mm wide expanded, 3-veined, free from the lateral sepals, the lateral sepals free, spreading, ovate, subacute, oblique, 2.5 mm long, 1.5 mm wide, 1-veined; **petals** red, thick, narrowly obovate, subacute, 2.5 mm long, 0.6 mm wide, the labellar margin inflexed below the middle, with a descending, acute, toothlike process at the base; **lip** yellow, fleshy, ovoid, 1.25 mm long, 0.8 mm wide, the apex rounded, the margin thickened and irregularly dentate, the

disc with a prominent prowlike callus, verrucose anteriorly, concave and smooth below the middle, the base truncate, broadly fixed to the base of the column; **column** red, erect, stout, terete, 1.25 mm long, the anther exposed on the ventral surface of the erect gynostemium, the stigma ventral.

COLOMBIA: Dept. of Antioquia: Munic. of Yarumal, epiphytic in forest above Quebrada El Oro, alt. 1850 m, 16 Mar. 1989, *C. Luer, J. Luer, W. Teague & S. Dalström 14202* (Holotype: MO). Dept. of Valle del Cauca: epiphytic in forest above San José del Palmar, Alto de Los Galápagos, alt. 2100 m, collected by A. De Wilde, flowered in cultivation above Pereira, 15 May 1993, *C. Luer 16849* (MO); north of the pass between Urrao and Carmen de Atrato, alt. 2700 m, 30 May 1995, *C. Luer, J. Luer, R. Escobar et al. 17647* (MO).

This species occurs widely distributed in the Central Cordillera and the Western Cordillera of Colombia. It grows intermixed with the closely related *T. calceolaris* and *T. pseudolepanthes*, but it is readily distinguished from them by the very small flower with spreading lateral sepals, thick petals with a basal tooth, and a smaller lip. The callus of the lip is verrucose only on the anterior surface, the posterior surface concave and smooth all the way to the base.

Trichosalpinx pseudolepanthes Luer & Escobar, Orquideología 16: 183, 1984. Fig. 97.

Ety.: From the Greek *pseudo-*, "false," and the genus *Lepanthes* referring to the deceptive appearance of this species.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect, comparatively stout, 1.5-4.5 cm long, enclosed by 4-6 ciliate, lepanthiform sheaths. **Leaf** erect, coriaceous, suffused with purple beneath, elliptical, subacute to obtuse, apiculate, 15-25 mm long, 9-11 mm wide, the base contracted into a petiole 1-2 mm long. **Inflorescence** a strict, loose, successively many-flowered raceme, up to 13 cm long, borne by a filiform, sparsely spiculate peduncle 1-2.5 cm long, from near the apex of the ramicaul; floral bracts spiculate, acuminate, 1-3 mm long; pedicels 0.5-1 mm long; ovary glabrous to sparsely spiculate, 1.25-1.5 mm long; **sepals** pale yellow to purple, long-spiculate externally, the dorsal sepal ovate, acute, arcuate, concave, 2.75-4.5 mm long, 1.75-2 mm wide expanded, 3-veined, free from the lateral sepals, the lateral sepals free, approximate, ovate, oblique, acute, concave, 2.6-3.2 mm long, 1.2-1.5 mm wide, 1-veined; **petals** narrowly ovate, acute, acuminate, subfalcate, 2-4 mm long, 0.6-1.2 mm wide; **lip** purple, fleshy, ovoid, 2.2 mm long, 1.2-1.5 mm wide, the apex obtuse, with the margins crenate-papillose, the disc with a prominent, erect, rounded, papillose callus, the base truncate, smooth, broadly fixed to the base of the column; **column** purple, erect, stout, terete, 1.25 mm long, the anther exposed on the front surface of the erect gynostemium, the stigma ventral, but facing forward on the erect column.

COLOMBIA: Dept. of Antioquia: Munic. of Yarumal, epiphytic in forest above Quebrada El Oro, alt. 1850 m, 20 May 1983, *R. Escobar & E. Valencia 2623* (Holotype: SEL, Isotype: JAUM), C. Luer illustr. 9143; road to Briceño, Quebrada El Oro, alt. 1850 m, 16 Mar. 1989, *C. Luer, J. Luer, W. Teague & S. Dalström 14196* (MO); epiphytic in forest on road to El Cedro, alt. 2000 m, 16 Mar. 1989, *C. Luer, J. Luer, W. Teague & S. Dalström 14205* (MO). Dept. of Chocó: Río Negro, San José del Palmar, Cerro del Torrá, epiphytic in cloud forest above the helipuerto, alt. 1950 m, 11 Aug. 1988, *P. Silverstone-Sopkin, N. Paz, R. González, J.E. Ramos, L.H. Ramos & A. Henao 4322* (CUVC, MO); same area, below the summit, alt. 1940-2450 m, 30 Aug. 1988, National Geographic Society grant 3884-88, *P. Silverstone-Sopkin, N. Paz, R. T. González, J. E. Ramos, L. H. Ramos & A. Henao 4899, 4900* (CUVC, MO). Dept. of Valle del Cauca: epiphytic in cloud forest above San José del Palmar, Alto de Los Galápagos, alt. 2050 m, 13 May 1993, *C. Luer, J. Luer, R. Escobar, A. De Wilde & J. Julian 16810* (MO).

This species is widely distributed in both the central and the western cordilleras of Colombia. In habit, it appears similar to *Lepanthes* with an elongated, successively flowering raceme. The flowers are small and long-spiculate externally, the lateral sepals are free, the petals are acuminate, and the fleshy lip has a conspicuous papillose callus. The broadly truncate base is inflexibly attached to the pedestal-like base of the column.

Trichosalpinx ramosii Luer, sp. nov. Fig. 98.

Ety.: Named in honor of Dr. J. E. Ramos, co-collector of this species.

Species haec *T. pseudolepanthes* (Luer & Escobar) Luer affinis, sed petalis base late angulatis, labello spathulato epichilio late cordato concavo laevi denticulato, ad medium callo alto triangulari erecto papilloso distinguitur.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect, comparatively stout, 2-3.5 cm long, enclosed by 3-8 ciliate-spiculate, lepanthiform sheaths. **Leaf** erect, coriaceous, broadly elliptical, subacute to obtuse, mucronate, 12-20 mm long, 8-12 mm wide, the base contracted into a petiole ca. 1 mm long. **Inflorescence** a strict, loose, successively many-flowered raceme, up to 11 cm long, borne by a filiform peduncle 1-2 cm long, from near the apex of the ramicaul; floral bracts spiculate, acuminate, 1.5 mm long; pedicels 0.5-0.75 mm long; ovary glabrous, 1.8 mm long; **sepals** purple, yellow toward the apices, the dorsal sepal long-spiculate externally, ovate, acute, arcuate, concave, 4 mm long, 1.5 mm wide expanded, 3-veined, free from the lateral sepals, the lateral sepals free, approximate, ovate, oblique, acute, concave, 3.5 mm long, 1 mm wide, 1-veined; **petals** narrowly triangular, acute, 3.5 mm long, 1.5 mm wide at base, with acute, retrorse basal angles; **lip** spathulate, 3 mm long, 1.75 mm wide, the epichile broadly ovate, concave, obtuse, with the margins denticulate-papillose, the disc with a tall, erect, slender, triangular, papillose callus, the hypochile oblong, truncate, smooth, broadly fixed to the base of the column; **column** erect, stout, terete, clavate, 1.5 mm long, the anther exposed on the front surface of the erect gynostemium, the stigma ventral, but facing forward on the erect column.

COLOMBIA: Dept. of Chocó: Munic. San José del Palmar, Cerro del Torrá, cuenca del Río Negro below the heliport, alt. 1900 m, 17 Aug. 1988, *J. E. Ramos, P. Silverstone, L. H. Ramos et al. 1306* (Holotype: CUVC; Isotype: MO);

This species is one of six of this closely related group that occurs on the remote Cerro del Torrá in the Western Cordillera of Colombia. Vegetatively similar to all the others, *T. ramosii* is distinguished by free, glabrous, lateral sepals with the dorsal sepal long-spiculate; acute, triangular petals with retrorse basal angles; and a spathulate lip with the epichile cordate and concave with a denticulate margin but smooth within, and a tall, papillose, gnomon-like callus in the center.

Trichosalpinx silverstonei Luer, sp. nov. Fig. 99.

Ety.: Named in honor of Dr. Phillip Silverstone-Sopkin of Cali, Colombia, co-discoverer of this species.

Planta parva, foliis ellipticis ramicaulibus paulo brevibus, vaginis longispiculatis ad ostium dilatatis, sepalis lateralibus liberis, petalis late ovatis vel suborbiculatis breviter acuminatis et labelli callo erecto verrucoso distinguitur.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect, stout, 1-2 cm long, enclosed by 4-6 long-ciliate, lepanthiform sheaths with dilated ostia. **Leaf** green with purple veins, erect, coriaceous, elliptical, obtuse, 13-16 mm long including a petiole 1 mm long, 9-11 mm wide, the base cuneate into the petiole. **Inflorescence** a strict, loose, successively many-flowered raceme, up to 8 cm long, including the peduncle ca. 2 cm long, from near the apex of the ramicaul; floral bracts acuminate, long-spiculate, 2 mm long; pedicels 1.5 mm long; ovary 2 mm long, long-spiculate; **sepals** purple, yellow toward the center, long-spiculate externally, the dorsal sepal ovate, acute, concave, 2.5 mm long, 1.5 mm wide, 3-veined, free from the lateral sepals, the lateral sepals free, elliptical-ovate, acute, concave, 2.5 mm long, 1.5 mm wide, 1-(2-)veined; **petals** red, broadly elliptical to suborbicular, obtuse, shortly acuminate, 2.25 mm long, 1.75 mm wide, 1-veined; **lip** yellow, fleshy, elliptical-obovoid, 1 mm long, 0.75 mm wide, the apical half occupied by a thick, erect, obtuse, callus with the basal surface smooth and continuous with the claw-like base, papillose on the front surface with the margin lobulate, the base smooth, concave, inflexibly attached to the base of the column; **column** erect, stout, terete, 0.5 mm long, the anther exposed on the ventral surface of the erect gynostemium, the stigma ventral.

COLOMBIA: Dept. of Chocó: Munic. of San José del Palmar, Cerro del Torrá, above the heliport, primary rain forest, alt. 1920-1950 m, 11 Aug. 1988, National Geographic Society grant 3884-88, *P. Silverstone-Sopkin, N. Paz, R. T. González, J. E. Ramos, L. H. Ramos & A. Henao 4324* (Holotype: CUVC; Isotype: MO).

This species was collected with *T. spathulata* and *T. uvaria* by Phillip Silverstone and associates in rain forest on Cerro Torrá in the Chocó of Colombia, where all three are apparently endemic. Related to *T. pseudolepanthes*, all three are similar vegetatively with comparatively stout ramicauls with long, ciliate-spiculate sheaths and purple-veined, dark green leaves, but each with a distinct flower. *Trichosalpinx silverstonei* is distinguished by the proportionately large, overlapping, suborbicular petals, and a small lip with an erect, papillose callus.

Trichosalpinx spathulata Luer, sp. nov. Fig. 100.

Ety.: From the Latin *spathulatus*, "spathulate," referring to the petals.

Planta perparva, foliis ellipticis ramicaulibus plus minusve aequilongis, vaginis longispiculatis ad ostium dilatatis, sepalis spiculatis, lateralibus liberis, petalis longi-unguiculatis late spathulatis obtusis erosis et labelli callo erecto digitiformi distinguitur.

Plant very small, epiphytic, caespitose; roots slender. Ramicauls erect, stout, 10-18 mm long, enclosed by 3-4 long-ciliate, lepanthiform sheaths with dilated ostia. **Leaf** green with purple veins, erect, coriaceous, elliptical, obtuse, 10-15 mm long including a petiole 1 mm long, 7-10 mm wide, the base cuneate into the petiole. **Inflorescence** a loose, successively many-flowered raceme, up to 6 cm long, including the peduncle ca. 1 cm long, from near the apex of the ramicaul; floral bracts acuminate, long-spiculate, 1.5 mm long; pedicels 1 mm long; ovary 1 mm long; **sepals** rose, long-spiculate externally, the dorsal sepal obovate, acute, concave, 2.5 mm long, 1 mm wide, free from the lateral sepals, the lateral sepals free, elliptical-ovate, acute, concave, 2.5 mm long, 1.5 mm wide, 1-veined; **petals** rose, erect, broadly spathulate, obtuse, erose, long-unguiculate, 2.5 mm long, including the claw 1 mm long, 1.5 mm wide, 1-veined; **lip** rose, fleshy, elliptical-obovoid, 1 mm long, 0.5 mm wide, the apical half occupied by an erect, finger-like callus, verrucose on the anterior surface, with the basal surface smooth and continuous with the claw-like base, the margins thinly dilated with lobulated margins, the base smooth, concave, inflexibly attached to the base of the column; **column** slender, arcuate, terete, 1.5 mm long, the anther apical, the stigma ventral.

COLOMBIA: Dept. of Chocó: Munic. of San José del Palmar, Cerro del Torrá, above the heliport, primary rain forest, alt. 1920-1950 m, 11 Aug. 1988, National Geographic Society grant 3884-88, *P. Silverstone-Sopkin, N. Paz, R. T. González, J. E. Ramos, L. H. Ramos & A. Henao 4323* (Holotype: CUVC; Isotype: MO); Cerro del Torrá, between heliport and mesa, 28 Aug. 1988, National Geographic Society grant 3884-88, *P. Silverstone-Sopkin, N. Paz, R. T. González, J. E. Ramos, L. H. Ramos & A. Henao 4830* (CUVC); Cerro del Torrá, east of Río Negro below the heliport, alt. 1600 m, 9 Aug. 1988, National Geographic Society grant 3884-88, *J. E. Ramos, P. Silverstone, L. H. Ramos et al. 1106* (CUVC); Cerro del Torrá, above heliport, alt. 1920 m, 8 Jan. 1984, *F. Silverstone-Sopkin, N. Paz, A. Duque & H. Bayona 1642* (CUVC).

This species, apparently endemic in rain forest on Cerro Torrá in the Chocó of Colombia, is allied to *T. silverstonei* and *T. uvaria*, companion plants, as well as *T. pseudolepanthes*. Vegetatively, it is small with a comparatively stout ramicaul enclosed by long-ciliate sheaths. The flowers are distinguished by concave, spiculate sepals; long-unguiculate, broadly spathulate, erose petals; and a lip with an erect, finger-like callus. The margins of the lip are thin and dilated with lobulate margins.

Trichosalpinx uvaria Luer, sp. nov. Fig. 101.

Ety.: From the Latin *uvarius*, "like a bunch of grapes," referring to the callus of the lip.

Planta parva, foliis late ellipticis apice mucronatis ramicaulibus plus minusve aequalongis, vaginis spiculatis ad ostium dilatatis, sepalis lateralibus liberis, petalis triangularibus supra basim cum lobulo uncinato et labelli callo grandi crasso erecto uviformi distinguitur.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect, stout, 5-18 mm long, enclosed by 3-5 long-ciliate, lepanthiform sheaths with dilated ostia. **Leaf** green with purple veins, erect, coriaceous, broadly elliptical, subacute to obtuse with a prominent mucro, 11-13 mm long including a petiole 1-1.5 mm long, 5-10 mm wide, the base cuneate into the petiole. **Inflorescence** a strict, loose, successively many-flowered raceme, up to 7 cm long including the peduncle 1-1.5 cm long, from near the apex of the

ramicaul; floral bracts acuminate, long-spiculate, 1.5 mm long; pedicels 0.75 mm long; ovary 0.8 mm long; **sepals** white, the dorsal sepal long-spiculate externally, ovate, acute, concave, 3.5-4.5 mm long, 1.6-2 mm wide expanded, 3-veined, free from the lateral sepals, the lateral sepals glabrous, free, elliptical-ovate, acute, concave, 3-4 mm long, 1-1.5 mm wide, 1-veined; **petals** yellow, thickened toward the apex, triangular, acute, 2.5-4 mm long, 1 mm wide at the base, 1-veined, with a retrorse, uncinate lobule on the upper margin above the base; **lip** red-violet, fleshy, elliptical-ovoid, obtuse, 2-2.5 mm long, 1 mm wide, the apical 2 thirds occupied by a thick, erect, ovoid, obtuse, prominently lobulated callus with the basal surface smooth and continuous with the claw-like base, the base smooth, concave, inflexibly attached to the base of the column; **column** erect, stout, terete, 1 mm long, the anther exposed on the ventral surface of the erect gynostemium, the stigma ventral.

COLOMBIA: Dept. of Chocó: Munic. of San José del Palmar, Cerro del Torrá, above the heliport, primary rain forest, alt. 1920-1950 m, 11 Aug. 1988, National Geographic Society grant 3884-88, *P. Silverstone-Sopkin, N. Paz, R. T. González, J. E. Ramos, L. H. Ramos & A. Henao 4322* (Holotype: CUVC; isotype: MO); Cerro del Torrá, below summit, alt. 1940-2450 m, 30 Aug. 1988, National Geographic Society grant 3884-88, *P. Silverstone-Sopkin, N. Paz, R. T. González, J. E. Ramos, L. H. Ramos & A. Henao 4898* (CUVC).

This species, apparently endemic in rain forest on Cerro Torrá in the Chocó of Colombia, is closely allied to *T. pseudolepanthes*, but *T. uvaria* is smaller vegetatively with a comparatively stout ramicaul enclosed by long-spiculate sheaths; smaller flowers; petals with a prominent, hook-like lobe above the base; and a lip with a proportionately large callus that occupies two-thirds of the lip. It is prominently lobulate-papillose like a bunch of grapes.

Trichosalpinx zunagensis Luer & Hirtz, sp. nov. Fig. 102.

Ety.: Named for the Río Zuñag in east-central Ecuador where the species was discovered.

Planta parva, foliis ellipticis ramicaulibus brevioribus, vaginis ciliatis, sepalis lateralibus in synsepalum ovatum partim connatis, petalis anguste ovatis acutis et labelli callo subclavato distinguitur.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 3-4 cm long, enclosed by 4-6 ciliate, lepanthiform sheaths. **Leaf** erect, coriaceous, elliptical, obtuse, 25-33 mm long including a petiole 3-4 mm long, 10-14 mm wide, the base cuneate into the petiole. **Inflorescence** a substrict, loose, successively several-flowered raceme, up to 8 cm long, borne by a filiform peduncle 4-5 cm long, from near the apex of the ramicaul; floral bracts acuminate, spiculate, 2-3 mm long; pedicels 1.5 mm long; ovary long-spiculate, 3-4 mm long; **sepals** orange, long-spiculate externally, the dorsal sepal ovate, acute, concave, 5.5 mm long, 3 mm wide expanded, 3-veined, free from the lateral sepals, the lateral sepals connate into an ovate, acute, concave, shortly bifid synsepal, 5 mm long, 3.75 mm wide, 2-veined; **petals** orange, narrowly triangular, acute, 5 mm long, 1 mm wide, 1-veined; **lip** orange, fleshy, elliptical-ovoid, 4 mm long, 2.5 mm wide, the apex obtuse with the margins minutely crenulate, the disc with an erect, oblong, subclavate callus, papillose on the front surface, much narrower than the blade, the base smooth, concave, inflexibly attached to the base of the column; **column** orange, erect, stout, terete, 2 mm long, the anther exposed on the ventral surface of the erect gynostemium, the stigma ventral.

ECUADOR: Prov. of Pastaza: epiphytic in cloud forest along Río Zuñag, alt. 2600 m, 23 Feb. 1990, *A. Hirtz, S. Dalström, L. Årnby, J. Del Hierro, E. Astorga, S. Ortega & J. Cabezas 4632* (Holotype: MO).

This species, apparently endemic in a remote, mountainous area of central Ecuador, is closely allied to the Colombian *T. calceolaris* and *T. pseudolepanthes*, but *T. zunagensis* is larger vegetatively with fewer, larger, orange flowers. It is also distinguished by the sepals that are connate to near the apex, and the larger lip with a smaller, verrucose callus that is slightly clavate at the rounded apex. It is much narrower than the blade.

Fig. 93. Trichosalpinx bricenoënsis

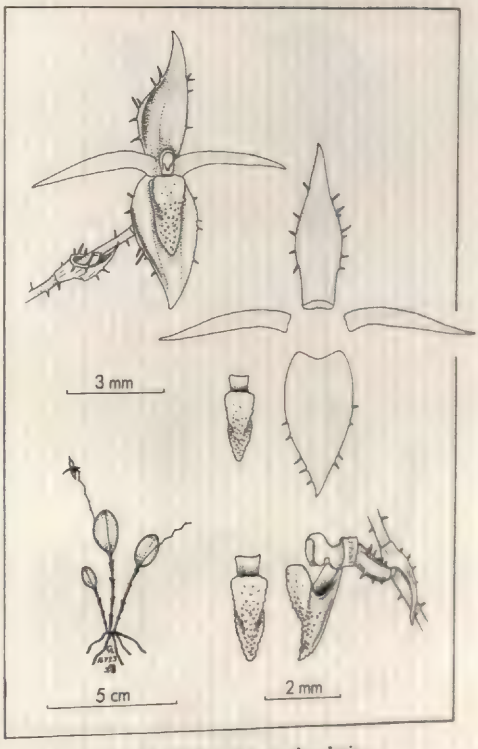

Fig. 94. Trichosalpinx calceolaris

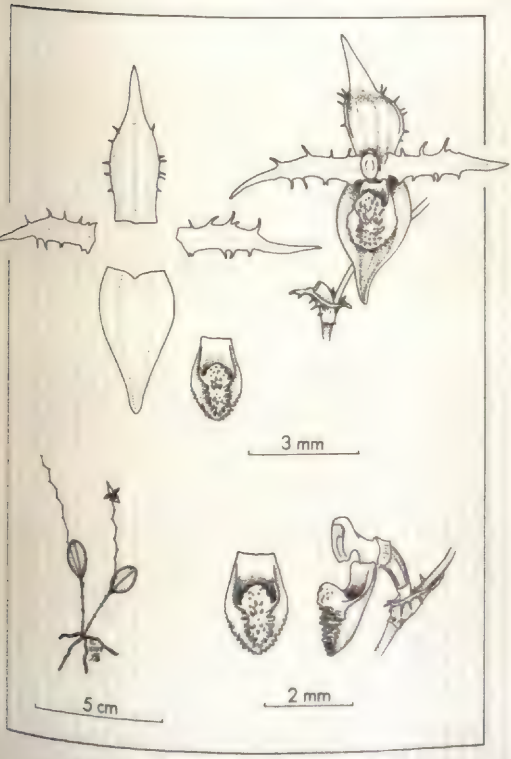

Fig. 95. Trichosalpinx decorata

Fig. 96. Trichosalpinx ectopa

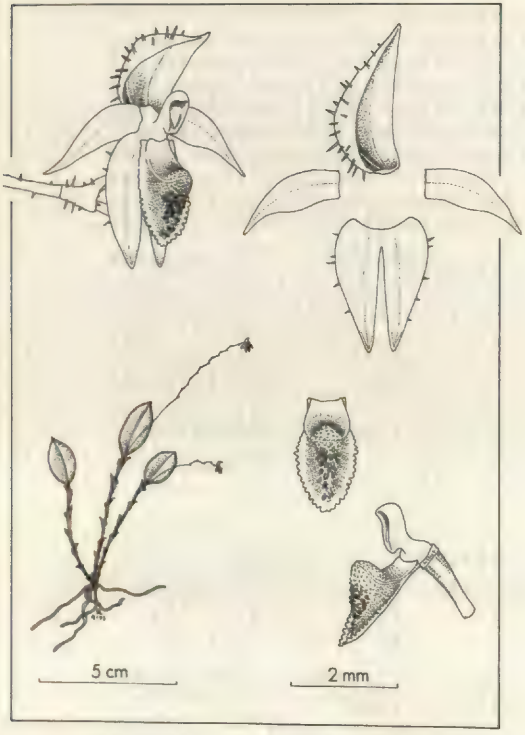

Fig. 97. Trichosalpinx pseudolepanthes

Fig. 98. Trichosalpinx ramosii

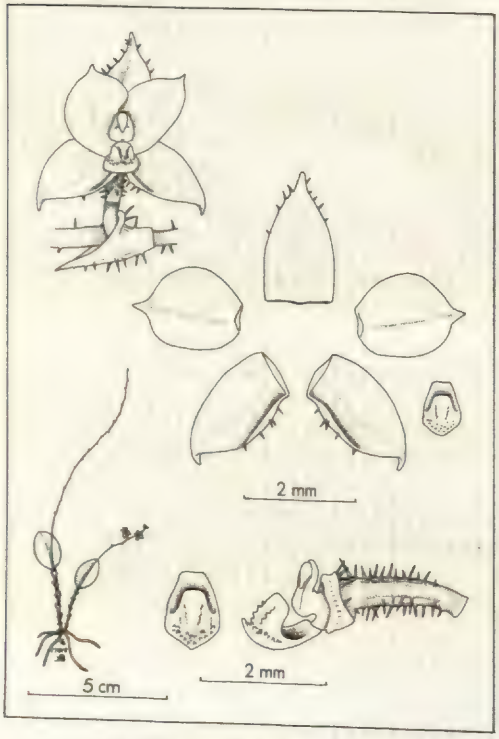

Fig. 99. Trichosalpinx silverstonei

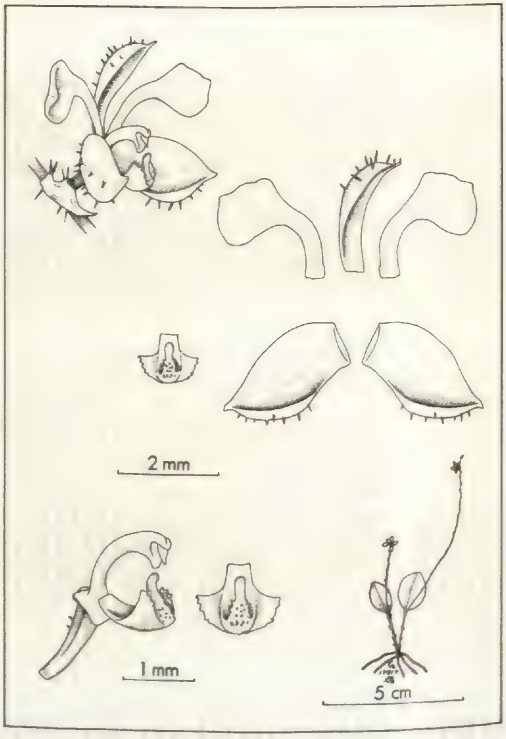

Fig. 100. Trichosalpinx spathulata

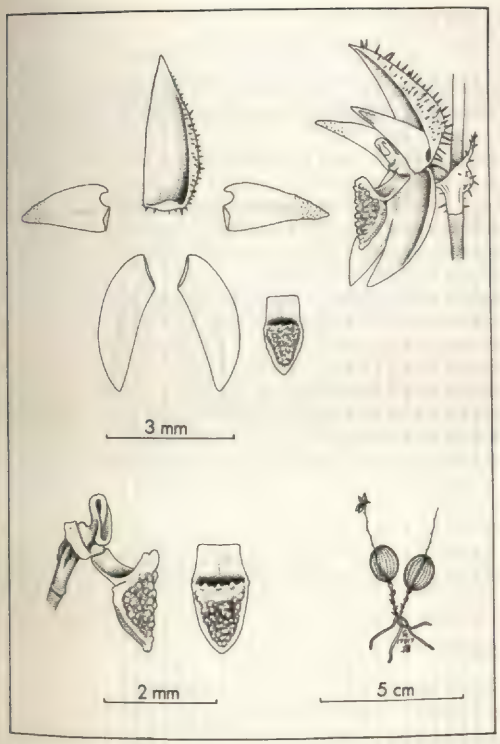

Fig. 101. Trichosalpinx uvaria

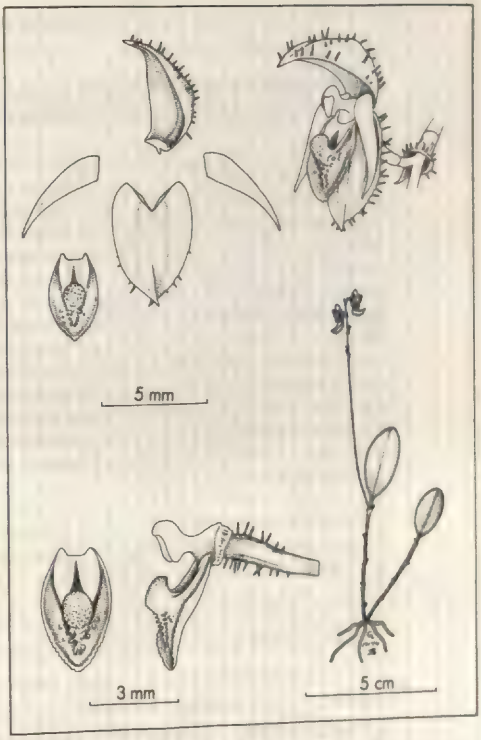

Fig. 102. Trichosalpinx zunagensis

SUBGENUS *XENIA*

Trichosalpinx ballatrix Luer & Escobar, Orquideología 16: 178, 1984. Fig. 103.

Ety.: From the Latin *ballatrix*, "a ballet dancer," in fancied allusion to the flowers.

Plant very small, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 3-10 mm long, enclosed by 2-3 minutely scabrous, lepanthiform sheaths. **Leaf** erect, coriaceous, mottled with purple beneath, broadly elliptical, obtuse, 6-10 mm long, 4-6.5 mm wide, cuneate below into a petiole 1 mm long. **Inflorescence** a delicate, loose, successively 2- to 3-flowered raceme, 20-40 mm long, including the filiform peduncle ca. 15 mm long, from near the apex of the ramicaul; floral bracts 1.5 mm long; pedicels 2-3.5 mm long; ovary 0.75 mm long; **sepals** light yellow, suffused with rose, especially along the veins, carinate, glabrous, the dorsal sepal obovate, obtuse, contracted into an attenuate, tail-like apex ca. 4 mm long, 7 mm long, 2 mm wide, 3-veined, free from the lateral sepals, the lateral sepals ovate, oblique, acute, long-caudate, 7 mm long with the tail 4 mm long, 1.3 mm wide, 1-veined, connate at the base; **petals** translucent yellow, membranous, obovate, acute, attenuate, caudate, 3.75 mm long including the tail 2 mm long, 1 mm wide; **lip** yellow, suffused with rose above the middle, thick, microscopically pubescent, obovate, 1.5 mm long, 1.1 mm wide, the apex rounded with an obscure, obtuse apiculum, the disc thickened with a pair of low, rounded calli along either margin, shallowly concave between, the base subtruncate, convex, deeply concave beneath; **column** stout, semiterete, 1 mm long, the anther and stigma subapical, the foot thick.

COLOMBIA: Dept. of Antioquia: Munic. of Medellín, epiphytic in cloud forest west of Medellín, east of Boquerón, alt. 2380 m, 22 Apr. 1983, *C. Luer, J. Luer, R. Escobar et al. 8748* (Holotype: SEL); Munic. of Abriaquí, Río Herradura, alt. ca. 2500 m, 13 May 1983, *R. Escobar & E. Valencia 2588* (JAUM; SEL).

This species is rare and endemic in the Central Cordillera of Colombia. Vegetatively, it is characterized by very small, broadly elliptical leaves far surpassed by the loose, successively few-flowered raceme. Distinct from all the other species brought together into *Trichosalpinx*, the sepals and petals are long-caudate. The lip is obovate and shallowly cleft near the apex between a pair of low, rounded calli. The base is convex and deeply concave beneath.

Trichosalpinx escobarii Luer, sp. nov. Fig. 104.

Ety.: Named in honor of Rodrigo Escobar R. of Medellín, Colombia, authority on the orchids of Colombia, who discovered this species.

Planta parva, foliis anguste ellipticis ramicaulibus brevioribus, vaginis lepanthiformibus, sepalis ovatis liberis, petalis obovatis apice rotundatis, et labello trilobato sulcato, lobo anteriore fimbriato, lobis lateralibus acutis antrorsis distinguitur.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 3-5 cm long, enclosed by 5-7 minutely ciliate, lepanthiform sheaths. **Leaf** erect, thickly coriaceous, narrowly elliptical, acute, 25-38 mm long, 5-7 mm wide, narrowly cuneate below into a petiole 3-4 mm long. **Inflorescence** a strict, loose, successively several-flowered raceme, 3-5 flowers open simultaneously, up to 7 cm long, including the filiform peduncle 2-4 cm long, from near the apex of the ramicaul; floral bracts 2 mm long; pedicels 1-1.5 mm long; ovary 0.75 mm long; **sepals** translucent rosy white, suffused with rose along the veins, glabrous, the dorsal sepal ovate, subacute, concave, 4 mm long, 2 mm wide, 3-veined, free from the lateral sepals, the lateral sepals free, spreading, ovate, acute, oblique, 3.2 mm long, 1.5 mm wide, 2-veined; **petals** rosy white, suffused with rose along the midvein, membranous, obovate, broadly obtuse, 2.25 mm long, 1.5 mm wide; **lip** white, yellow in the center, fleshy, ovoid-trilobed, 2.5 mm long, 1-1.5 mm wide, 1 mm deep, the apical lobe obtuse, fimbriate, sulcate centrally between a pair of calli that extend forward from the bases of the lateral lobes, the lateral lobes below the middle, acute, antrorse, thick, deeply sulcate between, the base subtruncate, broadly attached to the column-foot; **column** white, suberect, terete, 1 mm long, the anther and stigma apical.

COLOMBIA: Dept. of Cundinamarca: Represa de Sisga north of Bogotá, alt. 2880 m, collected by R. Escobar & E. Valencia, 27 Feb. 1987, flowered in cultivation at Colomborquídeas, 12 Apr. 1989, *J. X. Munera & R. Escobar 607* (Holotype: MO), C. Luer illustr. 14415.

This species is distinguished from the other species of the subgenus by the membranous sepals and petals, broadly obtuse petals, and a fleshy, three-lobed lip. The anterior lobe is fringed and cleft between calli from the lateral lobes. The lateral lobes are acute, antrorse, and basally thick and broadly sulcate between.

Trichosalpinx hypocrita (Garay & Dunst.) Luer, Phytologia 54: 395, 1983. Fig. 105.

Bas.: *Pleurothallis hypocrita* Garay & Dunst., Venez. Orchids Illustr. 6: 344, 1976.

Ety.: From the Greek *hypocrites*, "a pretender," referring to the similarity to *Lepanthopsis*.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 2.5-5 cm long, enclosed by 3-5 minutely ciliate, lepanthiform sheaths. **Leaf** erect, thickly coriaceous, elliptical, subacute, 15-20 mm long, 5-7 mm wide, cuneate below into a petiole 2-3 mm long. **Inflorescence** a loose, lightly flexuous, simultaneously several-flowered raceme, 3-6 cm long, including the filiform peduncle 1.5-2 cm long, from near the apex of the ramicaul; floral bracts 1.5 mm long; pedicels 1 mm long; ovary 1 mm long; **sepals** translucent yellow, glabrous, the dorsal sepal obovate, subacute, long-acuminate, lightly concave with the apex recurved, 3.5-4 mm long, 1.2 mm wide, 1-veined, free from the lateral sepals, the lateral sepals connate to about the middle and recurved, ovate, oblique, acute, acuminate, 3.5-4 mm long, 2 mm wide together, each 1-veined; **petals** translucent yellow, obovate, broadly obtuse, 1.66 mm long, 0.8 mm wide; **lip** purple, fleshy, cellular-glandular, oblong-obovate, 1 mm long, 0.75 mm wide, the apex rounded, the sides broadly rounded, the disc with a pair of small, conical calli above the middle, the base thickened, truncate, broadly attached to the column-foot; **column** purple, stout, terete, 1 mm long, the anther subapical, the stigma ventral.

VENEZUELA: Edo. Zulia: Sierra de Perijá, headwaters of the Río Negro, alt. ca. 3000 m, *S. S. Tillett 746-682* (Holotype: AMES); headwaters of Río Guasare, alt. 2700-3300 m, 20-23 July 1974, *C. W. Wood & P. E. Berry 76* (MO, VEN).
COLOMBIA: Dept. of Magdelena: Sierra de Perijá, east of Manaure, Quebrada de Floridablanca, alt. 2700-2800 m, 10 Nov. 1959, *J. Cuatrecasas & R. Romero C. 25183* (US); Santa Marta, road to TV tower, collected by E. Valencia, cultivated at Colomborquídeas, 6 May 1983, *C. Luer 9061* (SEL).

This pretty, little species from Santa Marta in Colombia and adjacent Venezuela is distinguished by the raceme of several, simultaneous, delicate flowers. The appearance of the habit suggests *Lepanthopsis*, but the column is cylindrical with the stigma united into a single lobe. The sepals are acuminate and recurved above the middle; the petals are obtuse, and the tiny lip is thick with a pair of minute, conical calli on the disc above the middle. These calli, present on the illustration published as the type, are not mentioned in the description.

Fig. 106.

Trichosalpinx lilliputalis (Luer & Hirtz) Luer, comb. nov.

Bas.: *Lepanthopsis lilliputalis* Luer & Hirtz, Monogr. Syst. Bot. 52: 118, 1994.

Ety.: Named for the fictional country visited by Gulliver where everything was minute.

Plant small, up to 8 cm tall, epiphytic, prolific; roots slender. Ramicauls erect, slender, producing another ramical from the apex, 10-15 mm long, enclosed by 4-5 lepanthiform sheaths, microscopically ciliate along brown ribs, and with ciliate ostia. **Leaf** erect, coriaceous, elliptical, acute, 9-12 mm long, 3.5-4 mm wide, cuneate below into a petiole 1 mm long. **Inflorescence** a loose, secund, simultaneously several-flowered raceme, 15-22 mm long, including the filiform peduncle 5 mm long, from the apex of the ramicaul; floral bracts 0.5 mm long; pedicels 1 mm long; ovary 0.25 mm long; **sepals** translucent brown, glabrous, the dorsal sepal ovate, subacute, 1.6 mm long, 0.9 mm wide, 3-veined, free from the lateral sepals, the lateral sepals free, recurved, ovate, acute, oblique, 1.3 mm long, 0.6 mm wide, 1-veined; **petals** translucent brown, obovate, acute, 0.9 mm long, 0.3 mm wide; **lip** green, fleshy, cellular glandular, obovate, trilobed above the middle, with the lobes obtuse, 1.1 mm long, 1.1 mm wide expanded, the disc with a pair of parallel calli at the base, the base hinged to the column-foot; **column** terete, 0.5 mm long, the anther dorsal, the stigma ventral.

ECUADOR: Prov. of Esmeraldas: epiphytic in wet forest west of Lita, alt. 400 m, Oct. 1991, *A. Hirtz 5612* (Holotype: MO), C. Luer illustr. 16206; same area, alt. 300 m, 12 Jan. 1992, *C. Luer, A. Hirtz et al. 15575* (MO).

This tiny species, apparently endemic in lowland northwestern Ecuador, is characterized by the prolific habit with lepanthiform sheaths, and with simultaneously multiflowered, secund racemes. The free, ovate sepals are about 1.5 millimeters long; the petals are elliptical and acute, and the broad, trilobed lip bears a pair of basal calli. The column is short with a dorsal anther and an entire, ventral stigma.

Trichosalpinx tenuiflora (Schltr.) Luer, Phytologia 54: 397, 1983. Fig. 107.

Bas.: *Pleurothallis tenuiflora* Schltr., Repert. Spec. Nov. Regni Veg. 12: 488, 1913.

Ety.: From the Latin *tenuiflorus*, "with thin-textured flowers," referring to the sepals and petals.

Plant small, epiphytic, densely caespitose; roots slender. Ramicauls erect, slender, 2-3.5 cm long, enclosed by 4-6 ciliate, lepanthiform sheaths. **Leaf** erect, thickly coriaceous, narrowly elliptical, acute, 1.5-2.5 cm long, 3-5 mm wide, narrowly cuneate below into a subpetiolate base. **Inflorescence** a loose, lightly flexuous, successively several-flowered raceme, up to 6 cm long, including the filiform peduncle ca. 3 cm long, from near the apex of the ramicaul; floral bracts 1 mm long; pedicels 1 mm long; ovary 1 mm long; **sepals** translucent light yellow-green, glabrous, the dorsal sepal ovate, obtuse, lightly concave, 2.75 mm long, 1.4 mm wide, 3-veined, free from the lateral sepals, the lateral sepals connate at the base, spreading, ovate, obtuse, oblique, 2.5 mm long, 1.5 mm wide, 2-veined; **petals** yellow, membranous, obovate, broadly obtuse, 2 mm long, 1 mm wide, cellular-erose toward the apex; **lip** yellow, fleshy, cellular glandular, subquadrate, 1.75 mm long, 1 mm wide unexpanded, 1.25 mm deep, the apex rounded, the sides rounded, erect, very thick, deeply sulcate between, the margins below the middle thin and erose, the base truncate, broadly attached to the column-foot; **column** yellow, suberect, stout, terete, 1.5 mm long, the anther subapical, the stigma ventral.

BOLIVIA: Dept. of Santa Cruz: epiphytic in forest north of "Meson," near Samaipata, alt. 2000 m, Mar. 1911, *Th. Herzog 1880* (Holotype presumably destroyed at B); epiphytic in moist forest above Mairana, La Yunga, near Samaipata, alt. 2090 m, 8 Sept. 1991, *C. Luer, J. Luer, R. Vásquez & D. Ric 15412* (Lectotype here designated: MO; Isolectotypes: K, LPB).

This species is apparently endemic in central Bolivia. It was recently rediscovered probably very near where it was originally collected by Herzog. It is distinguished from the other species of the subgenus by the obtuse, membranous sepals and petals and an unusual, subquadrate, fleshy lip with cellular-glandular surfaces. The sides are very thick and erect, creating a deep channel. Below the middle, the margins are thin, narrow and erose. The lip, in the drawing of the flower published by Schlechter, was undoubtedly forcibly spread.

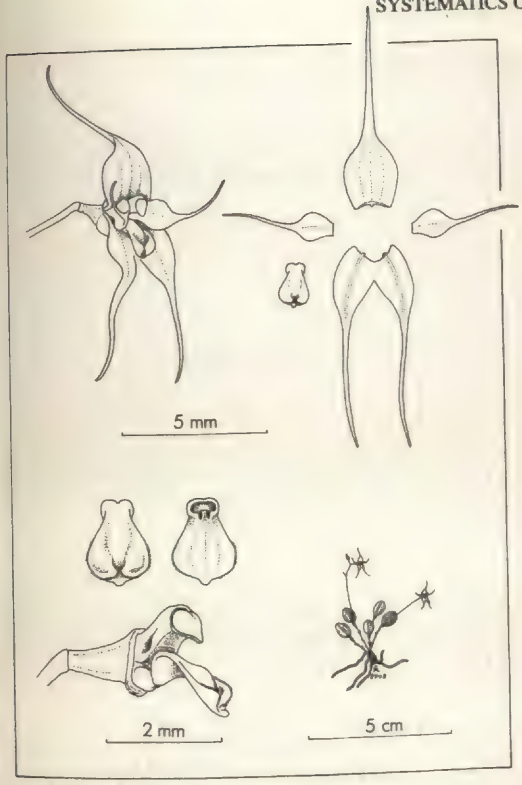

Fig. 103. Trichosalpinx ballatrix

Fig. 104. Trichosalpinx escobarii

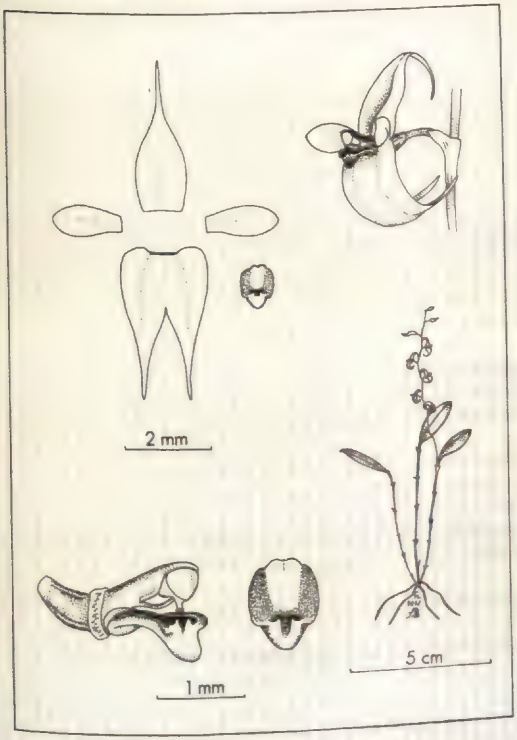

Fig. 105. Trichosalpinx hypocrita

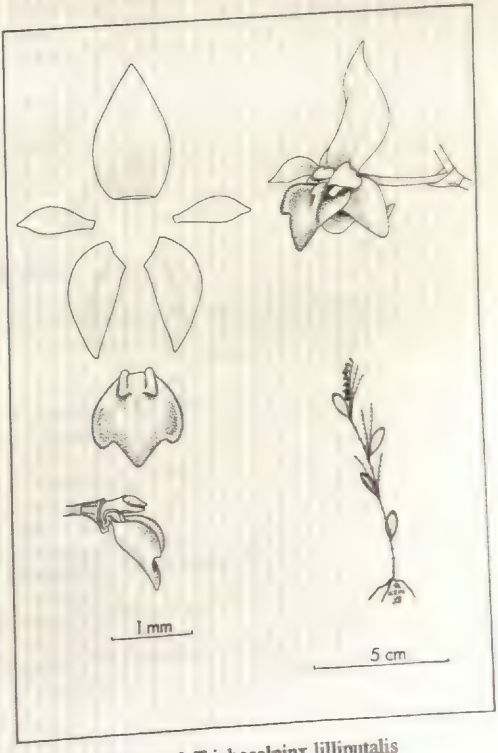

Fig. 106. Trichosalpinx lilliputalis

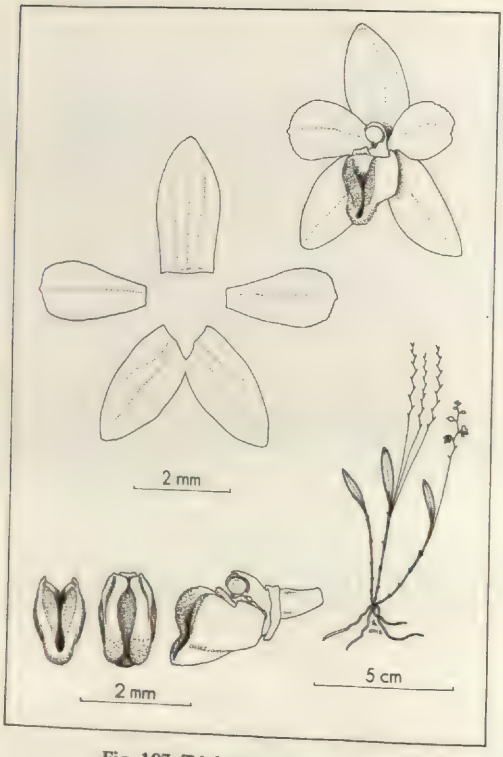

Fig. 107. Trichosalpinx tenuiflora

REFERENCES

AMES, O., 1933. A new genus in the Pleurothallidinae. Bot. Mus. Leafl. 1: 1, 1931.
BARRINGER, K., 1986. Typification of Schlechter's Costa Rican Orchidaceae I. Types collected by A. Brenes. Fieldiana Bot. 17: 1-24.
COGNIAUX, A., 1896. Orchidaceae in Martius, Flora Brasiliensis 579-587.
———— 1910. Orchidaceae Antillanae in Urban, Symbolae Antillanae 428-433.
DRESSLER, R. L., 1981. The orchids: natural history and classification. Harvard University Press, Cambridge.
DUNSTERVILLE, G.C.K. & L.A. GARAY, 1959-1976. Venezuelan Orchids Illustrated, vols. 2, 4, 6.
———— 1979, Orchids of Venezuela, An Illustrated Field Guide, vol. 3.
FOLDATS, E., 1970. Orchidaceae in Lasser, Flora of Venezuela 15, Orchidaceae 2: 173-452.
LUER, C. A., 1983. *Trichosalpinx*, a new genus in the Pleurothallidinae. Phytologia 54: 393-398.
———— 1986. Icones Pleurothallidinarum I. Systematics of the Pleurothallidinae. Monogr. Syst. Bot. 15: 65-69.
———— 1991. Icones Pleurothallidinarum VIII. Systematics of *Lepanthopsis*. Monogr. Syst. Bot. 39: 1-78.
SOTO, M. A., 1987. Revision of the Mexican species of *Trichosalpinx* subgenus *Trichosalpinx*. Orquidea (Méx.) 10: 278-296.

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VALIDATION OF TAXA PUBLISHED IN ICONES PLEUROTHALLIDINARUM XIV

Because of omissions of designation of holotypes in Monogr. Syst. Bot. 61, part 3, *Lepanthes* of Ecuador, the publication of the following species did not meet the requirements of the International Code of Botanical Nomenclature.

Page 53: **Lepanthes cauda-avis** Luer, sp. nov. Ecuador: Zamora-Chinchipe, *D. D'Alessandro 239* (Holotype: MO).
Page 112: **Lepanthes maccolmiana** Luer, sp. nov. Ecuador: Esmeraldas, *J.L. Clark & C. Watt 838* (Holotype: MO; Isotype: QCNE).
Page 141: **Lepanthes proboscidis** Luer & Hirtz, sp. nov. Ecuador: Imbabura, *C. Luer, J. Luer & A. Hirtz 15178* (Holotype: MO).

Because of typographical errors in Monogr. Syst. Bot. 61, part 3, *Lepanthes* of Ecuador, the publications of the following species are erroneously published. They should read:

Page 79: in **Lepanthes eriocampa** Luer & Hirtz, sp. nov. Ecuador: Morona Santiago, *Luer et al. 13879* should read *Luer et al. 13979* (Holotype: MO).
Page 118: in **Lepanthes meniscophora** Luer & Hirtz, sp. nov. Ecuador: Carchi, *Hirtz 3420* should read *Hirtz 3620* (Holotype: MO).
Addenda 1: **Brachionidium ingramii** Luer & Dalström, sp. nov. Ecuador: Imbabura, *S. Dalström et al. 2113* should read *S. Dalström et al. 2048* (Holotype: MO).
Addenda 6: **Pleurothallis panica** Luer & Dalström, sp. nov. Ecuador: Sucumbíos, *S. Dalström et al. 2113* should read *S. Dalström et al. 2123* (Holotype: MO).

Corrigenda for Monogr. Syst. Bot. 61, part 3, *Lepanthes* of Ecuador:

Page 19: 6 Lip transversely bilobed, as long as the lip, 'lip' should read 'column.'
6' Lip cordate, much shorter than the lip, 'lip' should read 'column.'
Page 20, last line: '3' should read '13.'
Page 23: 1' Sepals entire.....27, '27' should read '28.'
Page 112: in **Lepanthes lycocephala**, delete the word 'Holotype.'
Page 120: in **Lepanthes monitor**, delete the citation for *Luer et al. 13540.*
Paga 121: in **Lepanthes monoptera**, delete the citation only for *Hirtz et al. 4940* in first line.
Page 128: in **Lepanthes nontecta**, delete the citation for *Luer 9787.*
Page 146: in **Lepanthes repens**, delete the citation for **Napo.**
Page 148: in **Lepanthes rhynchion**, delete the citation for *Hirtz 1982.*
Page 174: in **Lepanthes urotepala**, *Hirtz 1635* should read *Hirtz 1653.*
Page 183: in **Lepanthes zamorensis**, delete the citation for *Luer et al. 16098.*
Page 253: in index, *corazonis* 10

Corrigendum for *Orquideología* 20(2): 231, 1996:

Pleurothallis torrana Luer, sp. nov., Colombia, Chocó, *P. Silverstone-Sopkin et al. 4334* should read *P. Silverstone-Sopkin et al. 4304* (Holotype: CUVC; Isotype: MO).

ADDENDA TO *DRACULA, MASDEVALLIA, MYOXANTHUS* AND *SCAPHOSEPALUM*

ABSTRACT

The following new species and subspecies of *Dracula* Luer, new species and a new combination in *Masdevallia*, a new species in *Scaphosepalum* Pfitz., and a species of *Myoxanthus* (Poepp. & Endl.) Luer previously published as a synonym, are added to genera already revised in previous numbers of *Icones*. The plates are numbered as continuations of their respective appearances in *Icones*.

New species, subspecies and stat. et nom. nov.:
Dracula kareniae Luer & Dalström, sp. nov.
Dracula sodiroi subsp. *erythrocodon* Luer & Dalström, subsp. nov.
Masdevallia amplexa Luer, sp. nov.
Masdevallia bicornis Luer, stat. et nom. nov.
Masdevallia harlequina Luer, sp. nov.
Masdevallia recurvata Luer & Dalström, sp. nov.
Scaphosepalum panduratum Luer & Escobar, sp. nov.

Dracula kareniae Luer & Dalström, sp. nov.

Ety: Named in honor of Karen Ferrell-Ingram of Bishop, Califomia, co-collector of this species.

Inter species generis *Draculae* sepalis in cupulum profundum profunde connatis intus cremeis punctatis brevissime pubescentibus, sepalorum caudis gracilibus, petalis densissimi multipapillosis, labello epichilio lamellata cum marginibus non involutis.

Plant medium in size, epiphytic, caespitose; roots coarse. Ramicauls slender, erect, 2-3 cm long, enclosed by 2-3 loose, tubular sheaths. **Leaf** erect, thinly coriaceous, carinate, 18-22 cm long including an indistinct petiole ca. 2 cm long, the blade narrowly obovate, acute, 2-2.5 cm wide, gradually narrowed below into the petiole. **Inflorescence** a suberect, loose, simultaneously few-flowered raceme, borne by a slender sparsely bracted peduncle 18 cm long, from low on the ramicaul; floral bracts tubular, oblique, 8-10 mm long; pedicels 15 mm long; ovary 5 mm long, round in cross-section; **sepals** dark red-purple externally, cream-colored within with purple dots and shortly pubescent within, the dorsal sepal obovate, 17 mm long, 19 mm wide, connate to the lateral sepals for 15 mm to form a campanulate, sepaline cup, the apex transverse, abruptly contracted into a slender, suberect, purple tail 4.5 cm long, the lateral sepals connate 16 mm into a transversely oblong lamina, 20 mm long, 30 mm wide, with a broad, shallow mentum, the apices transversely obtuse, abruptly contracted into spreading tails similar to that of the dorsal sepal; **petals** ivory with blackish brown center, cartilaginous, obovate, 3.5 mm long, 2.25 mm wide, bivalvate near the middle, densely papillose beyond the middle between the laminae, the inner lamina short, subacute, the outer lamina rounded, minutely denticulate; **lip** white, obscurely obpandurate, 7 mm long, 4 mm wide, the epichile rounded, concave, with the margins erect, not incurved, traversed by tall, longitudinal keels, 4-5 keels on either side of a central keel, 4 mm long, 4 mm wide, the hypochile indistinctly demarcated from the epichile, subovate, 3 mm long, 3 mm wide, with erect, narrowly rounded, marginal angles, deeply cleft centrally between a pair of bilobulate plates, the concave base hinged to the column-foot; **column** white, stout, semiterete, 4 mm long, with a stout foot 3 mm long.

ECUADOR: Prov. of Carchi: epiphytic in forest on ridge above Maldonado, alt. 2000 m, 17 Mar. 1996, flowered in cultivation 21 Sept. 1996, by J. Sönnemark in Halmstad, Sweden, *S. Dalström, S. Ingram & K. Ferrell-Ingram 2273* (Holotype: MO), C. Luer illustr. 18480.

This species is distinguished from other, similar species by the narrow, acute leaves, and a relatively large, campanulate flower. The long-tailed sepals are deeply connate, dark purple externally and pubescent and cream within with multiple small spots. The papillae between the valves of the petals are numerous. The epichile of the lip is concave with nine or ten lamellae radiating to non-involute margins.

In the key to the species of *Dracula* published in Icones 10, *D. kareniae* keys out to the Colombian *D. pholeodytes* which differs in possessing a deeply concave synsepal that is purple-black within.

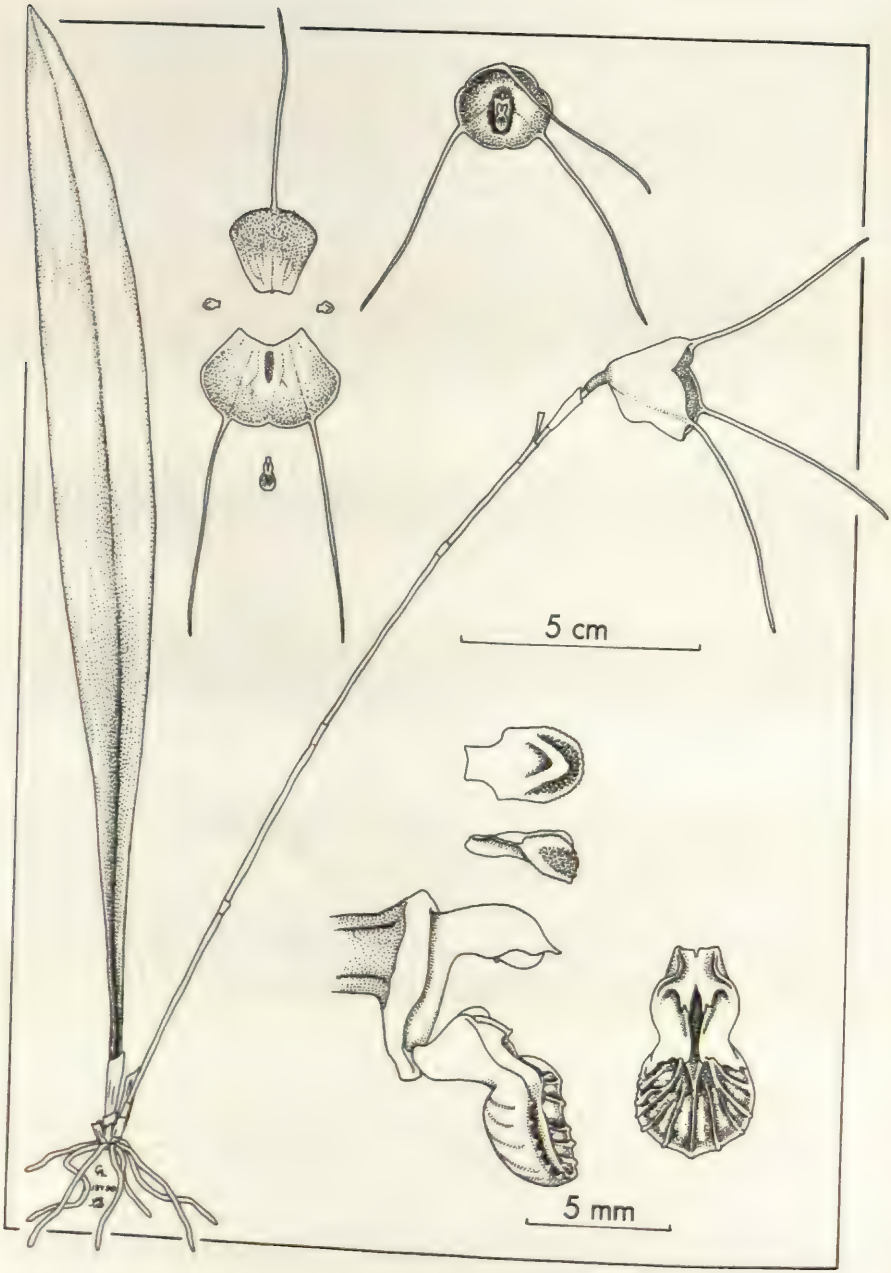

Plate 110. *Dracula kareniae* Luer & Dalström

Dracula sodiroi (Schltr.) Luer subsp. **erythrocodon** Luer & Dalström, subsp. nov.

Ety: From the Greek *erythrocodon*, "a red bell," referring to the campanulate flower.

Subsp. haec subsp. *D. sodiroi* affinis, sed pedunculo foliis breviore unifloro interdum cum flore secundo differt.

Plant medium in size, epiphytic, caespitose; roots coarse. Ramicauls slender, erect, 2-3 cm long, enclosed by 2-3 tubular sheaths. **Leaf** erect, thinly coriaceous, carinate, 15-23 cm long including an indistinct petiole, the blade very narrowly obovate, acute, 0.9-1.1 cm wide, gradually narrowed below into the indistinct subpetiolate base. **Inflorescence** a single, pendent flower, occasionally followed by a second, borne by a slender, erect, sparsely bracted peduncle 12-15 cm long, from low on the ramicaul; floral bracts tubular, oblique, 12-20 mm long; pedicels 20-25 mm long; ovary arcuate, 9 mm long, round in cross section; **sepals** dark red-purple shiny red externally, orange toward the base, shortly pubescent and whitish within, the dorsal sepal obovate-obcuneate, 20 mm long, 16 mm wide, connate to the lateral sepals for 23 mm to form a campanulate, sepaline cup, the subretuse apex abruptly contracted into a slender, pendent, purple tail ca. 37 mm long, the lateral sepals connate 24 mm into an obcuneate lamina, 23 mm long, 28 mm wide, with a shallow, longitudinal mentum, the subretuse apices abruptly contracted into descending tails similar to that of the dorsal sepal; **petals** ivory, thinly cartilaginous, flabellate, unguiculate, 5 mm long, 2.5 mm wide, obscurely bivalvate and minutely papillose toward the apex, the apex rounded, minutely denticulate, with a flat, dark purple callus below the middle; **lip** white, obscurely obpandurate, 7.5 mm long, 2.75 mm wide, the epichile indistinct, ovate, obtuse, sulcate to either side of a central carina, with a pair of erect lamellae below the middle on the hypochile, the base subtruncate, hinged to the column-foot; **column** white, stout, semiterete, 6 mm long, with a stout foot 4 mm long.

ECUADOR: Prov. of Carchi: epiphytic in forest on ridge above Maldonado, alt. 2000 m, 17 Mar. 1996, *S. Dalström, S. Ingram & K. Ferrell-Ingram 2179* (Holotype: MO), C. Luer illustr. 17842; same area, alt. 2200-2500 m, Jan. 1989, cultivated by J. Sönnemark in Halmstad, Sweden, 10 Aug. 1993, *S. Dalström 2047* (MO); above Río Verde, Cerro Golondrinas, alt. 2070-2430 m, 4 Dec. 1987, *W. S. Hoover 2305* (MO). Prov. Imbabura: Río Los Cedros, Aug. 1993, cultivated by J. Sönnemark in Halmstad, Sweden, Sept. 1994, *S. Dalström s.n.* (MO), C. Luer illustr. 17006.

This subspecies is locally abundant in moist forested slopes, distant from any known population of the typical subspecies which is usually found growing terrestrially. The subspecies differs from the typical subspecies by bearing usually only a single, red flower instead of a simultaneously few-flowered raceme of orange flowers. However, a second flower occasionally follows the first. The peduncle is usually shorter than the leaf. The flower is similar to the typical species except for being bright red externally and white within, and perhaps a little larger. The only morphological difference is the presence of a flat, purple callus on the inner surface of the claw of the petals below the middle.

Masdevallia amplexa Luer, sp. nov.

Ety.: From the Latin *apmlexus*, "clasping," referring to the petals.

Species haec *M. carruthersianae* F.Lehm. & Kraenzl. similis, sed synsepalo concavo marginibus erectis, petalis columnam amplectentibus, et labello alato apice convexo obtuso differt.

Plant medium in size, epiphytic, caespitose; roots slender. Ramicauls slender, erect, 2 cm long, enclosed by 2-3 tubular sheaths. **Leaf** erect, coriaceous, 9 cm long including an indistinct petiole ca. 1 cm long, the blade narrowly elliptical-oblong, subacute to obtuse, 1.5 cm wide, narrowly cuneate below into the base. **Inflorescence** a successively flowered, congested raceme, borne by an erect, slender, triquetrous peduncle to 17 cm long, with a bract above the base, from the base of a ramicaul; floral bracts imbricating, 15-17 mm long; pedicel 15 mm long; ovary 6 mm long; **sepals** rigidly fleshy, glabrous, the dorsal sepal yellow, suffused with rose, ovate, 10 mm long, 7 mm wide, 3-veined, connate to the lateral sepals for 5 mm to form a short, sepaline tube, the apex acute, contracted into an erect, slender, orange tail 2.5-3 cm long, the laterals deep red-purple, connate 15 mm into a concave lamina 20 mm long, 20 mm wide expanded, with a small but deep secondary mentum at the base, 6-veined with the veins thickened, the apices obtuse, approximate, contracted into yellow tails 13 mm long; **petals** white with purple dots at the apex, oblong, 5 mm long, 2 mm wide, the apex broad, irregularly truncate with the upper margin thin and embracing the column, the labellar half with longitudinal thickening ending in a rounded callus at the base; **lip** rose, dotted diffusely with purple, oblong-subpandurate, arcuate, 5 mm long, 2 mm

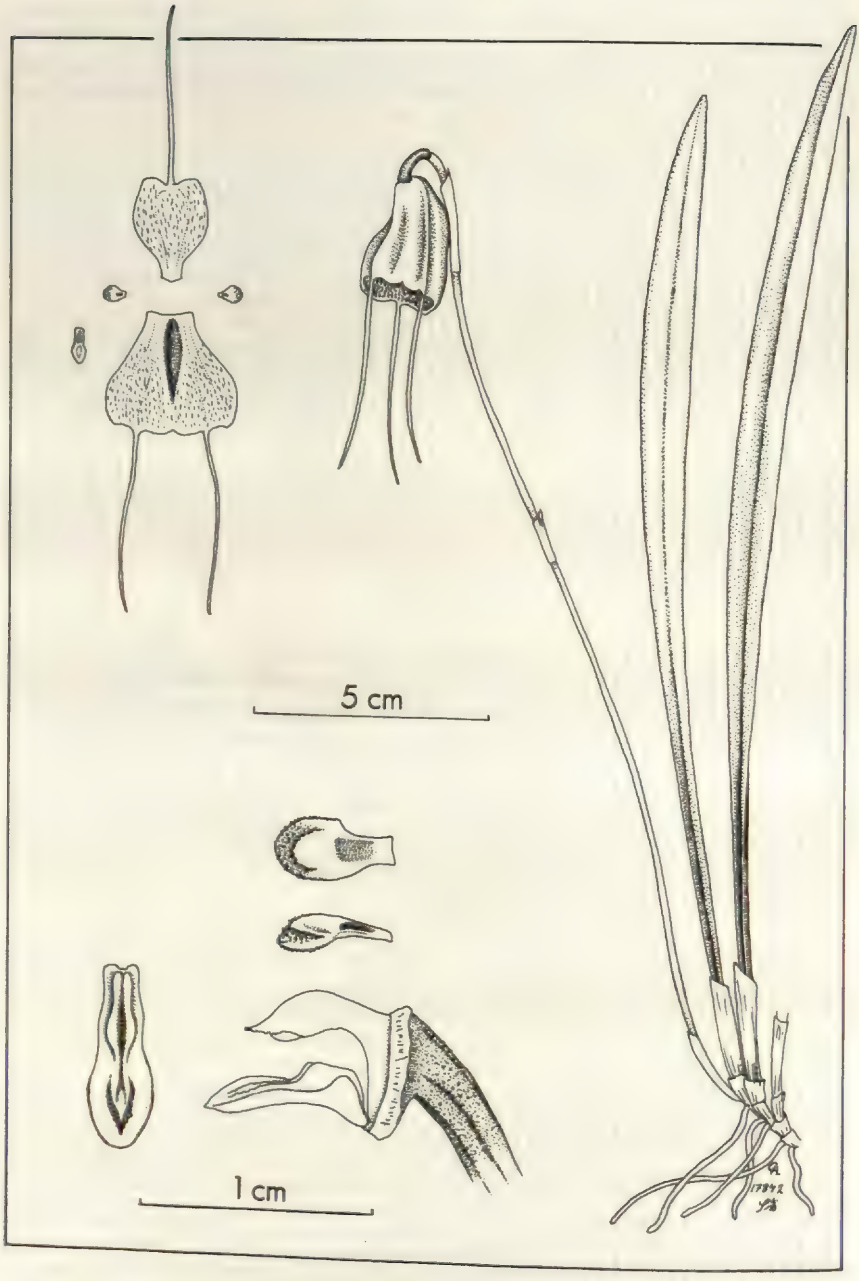

Plate 111. *Dracula sodiroi* (Schltr.) Luer subsp. *erythrocodon*

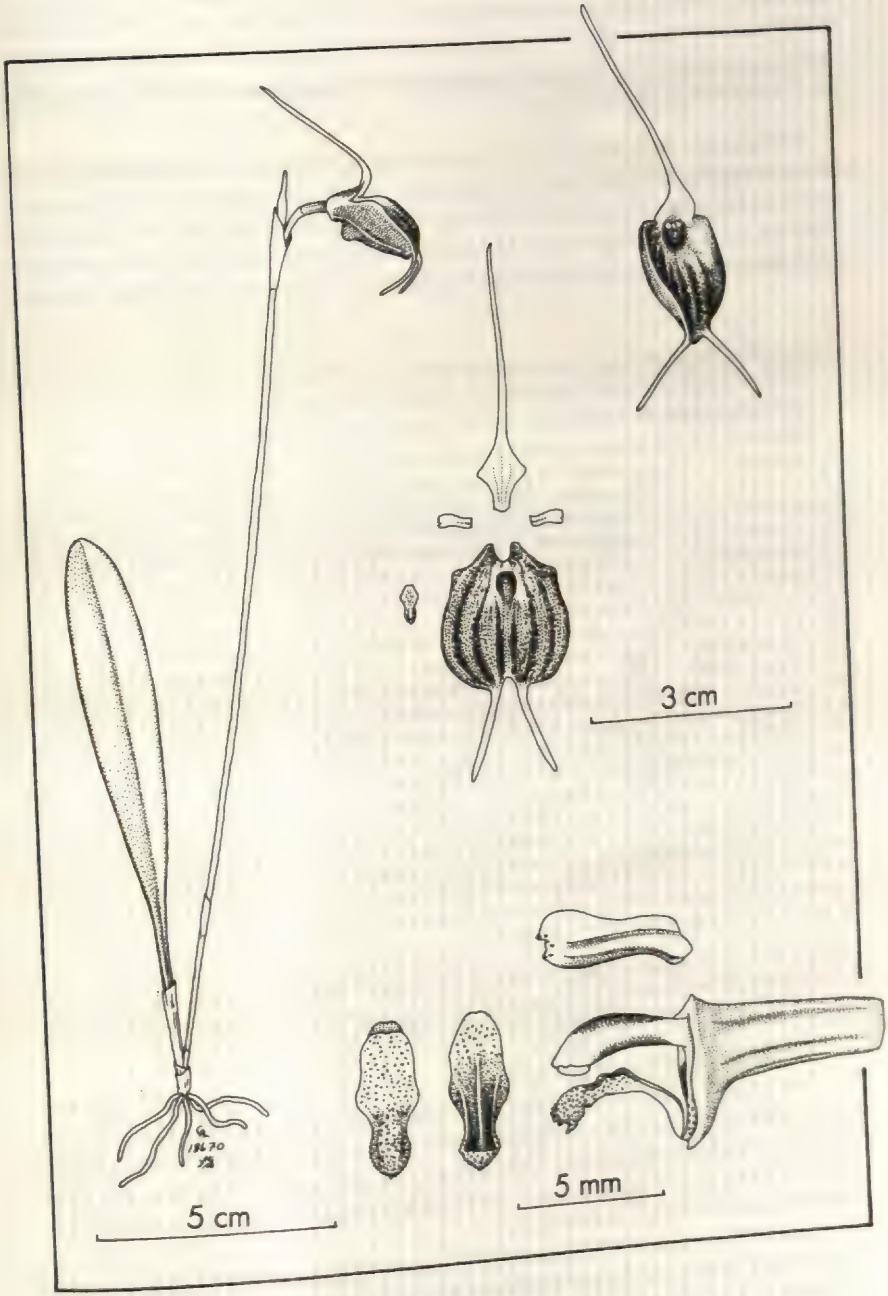

Plate 29. *Masdevallia amplexa* Luer

wide, thinly winged near the middle, the apex convex, minutely verrucose, with the acute tip decurved, the base descending, truncate, hinged from the end to a short, incurved extension of the column-foot; **column** white, suffused with rose, semiterete, 5 mm long, the foot 4 mm long, spotted, with an incurved extension.

PERU: Dept. of Huánuco: near Tingo Maria, obtained from M. Arias, cultivated by J & L Orchids, 1297-548, *C. Luer 18670* (Holotype: MO).

Superficially resembling *M. carruthersiana*, this species is distinguished from others in subsection *Alaticaules* by the concave synsepal with the veins thickened within and relatively short recurving tails. Most distinguishing are the petals that clasp the column with dilated margins above the middle. The lip differs with the usual marginal folds becoming winglike extensions of the margin above the middle.

Masdevallia bicornis Luer, stat. et nom. nov.

Ety.: From the Latin *bicornis*, "two-horned," referring to the labellum.

Syn.: *Portillia popowiana* Königer & J.Portilla, Archila 6: 156, 1996, not *M. popowiana* Königer.

Plant medium in size to large, epiphytic, caespitose; roots slender. Ramicauls stout, erect, 2-2.5 cm long, enclosed by 2-3 loose, tubular sheaths. **Leaf** erect, thinly coriaceous, 10-21 cm long including a petiole 3-5 cm long, the blade narrowly elliptical-obovate, subacute, 3-3.5 cm wide, the base narrowly cuneate into the petiole. **Inflorescence** a solitary, nutant flower, possibly followed by a second, borne by a more or less horizontal, scurfy peduncle 12-24 cm long, with 3 distant bracts, the peduncle covered by more or less branching scales, from near the base of a ramicaul; floral bract tubular, oblique, 7-10 mm long; pedicel 8-12 mm long; ovary arcuate, smooth to minutely verrucose, 6-8 mm long; **sepals** red-brown with yellow tails, glabrous, subcarinate externally, the dorsal sepal triangular, 15 mm long, 12 mm wide, 3-veined, connate to the lateral sepals for 5 mm without forming a sepaline tube, the apex subacute, contracted into a forwardly directed, slender tail 40-45 mm long, the lateral sepals connate 18 mm into a broadly expanded, bifid, obovate lamina, 25 mm long, 24 mm wide, 6-veined, each half sulcate between a pair of longitudinal, obtusely subplicate convexities, the apices obtuse with the medial margins inflexed, contracted into slender tails 30-35 mm long; **petals** light yellow, cartilaginous, arcuate, oblong, 5 mm long, 1 mm wide at the center, the apex obtusely obliquely bilobed, 2 mm wide, the base with an acute, descending process 1.5 mm long, connate obliquely to the column just above the base; **lip** oscillating, dark brown, light brown at the base, with yellow calli, oblong-subpandurate, 7 mm long, 3 mm wide above the middle, 1.4 mm wide at the middle, the apex shallowly bilobed with the lobes rounded, the disc with a tall, grooved, obtuse lamina on the lower third, and sulcate above the middle between a longitudinal pair of calli, with a pair of acute, uncinate processes 1 mm long emerging from the lateral surface on the basal fourth, concave beneath, attached within with a short, thin strap to the column-foot; **column** light yellow, arcuate, semiterete, 8 mm long, narrowly winged above the middle, the foot thick with a short, thin, incurved extension.

ECUADOR: Prov. of Morona-Santiago: El Pangui, alt. 1000 m, collected by J. Portilla, exported to N. Popow, flowered in cultivation in München by *Königer WK-73* (Holotype: M, Isotypes reported but not present at K, QCA); "Macas," alt. 700 m, *A. Hirtz 6581* (MO), C. Luer illustr. 18609.

This distinctive species, apparently endemic in lowland, southeastern Ecuador, was described in a monotypic genus by Königer without explanation, reason, comparison, or discussion. An examination and an illustration of a subsequent collection reveal that the species is closely allied to subsection *Oscillantes* of section *Masdevallia*. The species was first collected in 1996 by José Portilla who exported plants to Popow in Germany.

Masdevallia bicornis is characterized by a short ramicaul and a thinly coriaceous, petiolate leaf, far larger than that of any of the members of the subsection *Oscillantes*. The species is distinguished from all known members of *Masdevallia* by the long peduncle that is densely covered by branching, scaly trichomes that are very similar to those found covering the peduncles of some species of *Scaphosepalum*. This single, morphological feature, unique in the genus *Masdevallia*, is not

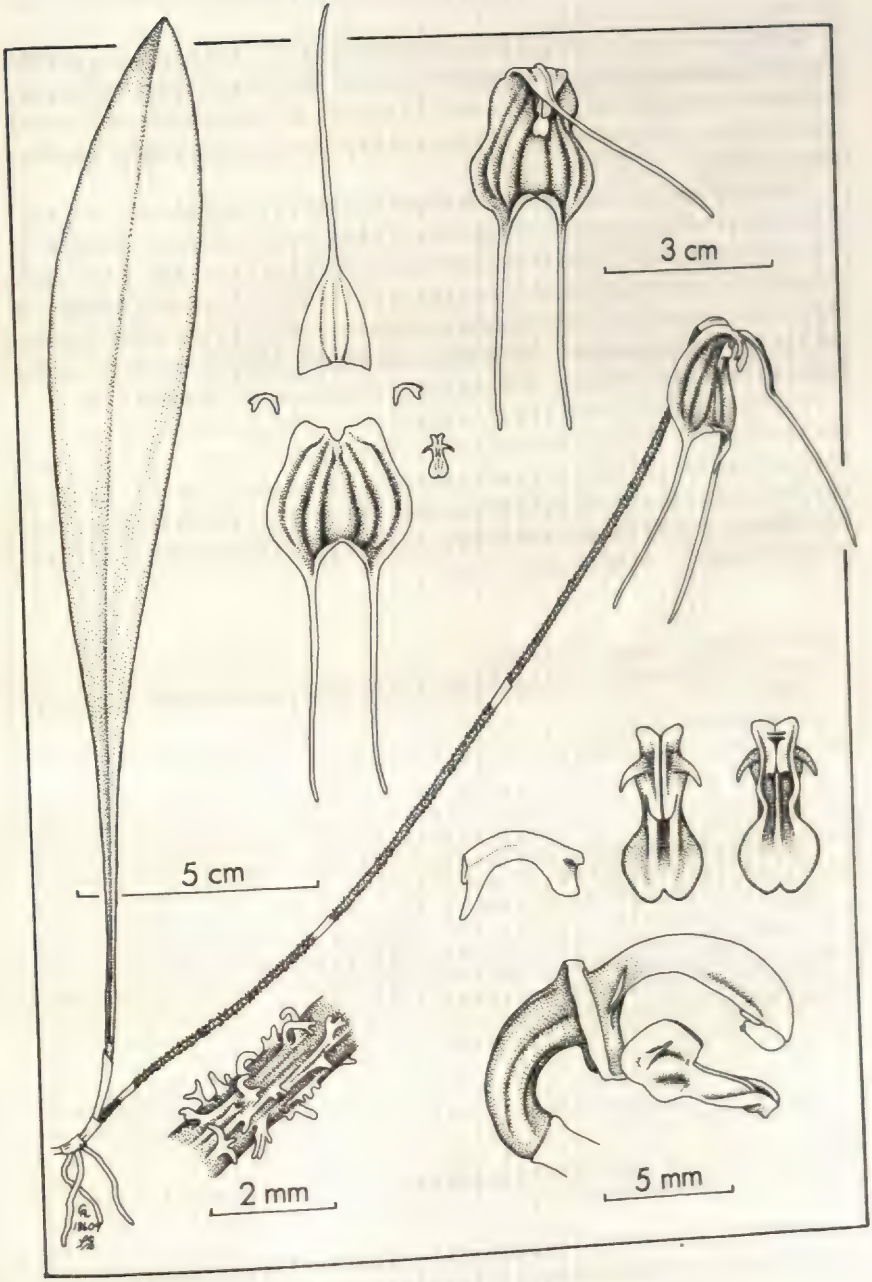

Plate 30. *Masdevallia bicornis* Luer

sufficient to remove the species from the genus while the flowers are typical of a subgeneric taxon. Both smooth peduncles and scurfy or verrucose peduncles occur in several pleurothallid genera.

Except for the pair of tiny thorn-like processes on the lip, the morphology of the flowers is characteristic of subsection *Oscillantes*. The dorsal sepal is connate to the lateral sepals without forming a tube. The sepals are long-caudate, the laterals with subplicate veins reminiscent of those seen in *M. empusa* Luer and *M. trochilus* Lind. & André.

The petals are short, arcuate and cartilaginous with a pointed process, or tooth, at the base exactly as seen in several species of subsection *Oscillantes*. The lip is of the same basic design found in all members of the subsection, with a tall, cleft callus closely resembling that of *M. catapheres* Königer. An interesting addition to the lip of *M. bicornis* is the pair of minute, pointed appendages that arise from the sides of the lip above the base. These processes could possibly be analogous to the lateral lobules found on the lips of *M. andreettana* Luer and *M. persicina* Luer.

The lip is flexibly joined to the column-foot by a thin, strap-like hinge, the extension from the tip of the column-foot. It is attached within the concave under surface of the base of the lip, in a manner similar to that of all the species of subsection *Oscillantes*, to permit an oscillating motion. The proportionately large, arcuate, longitudinally winged column with ventral anther, pollinarium and stigma is typical of all the species of the subsection.

Masdevallia harlequina Luer, sp. nov.

Ety.: Named for Harlequin, the clownish character of Italian comedy noted for a mask and spangled tights.

Inter species *Masdevalliae* subsect. *Caudatae* synsepalo ad medium concavo, sepalorum caudis longissimis recurvis, petalorum dente crassissimo, et labello fimbriato distinguitur.

Plant small, epiphytic, caespitose; roots slender. Ramicauls black, stout, erect, 1 cm long, enclosed by 2-3 tubular sheaths. **Leaf** erect, coriaceous, 4.5-5.5 cm long including the petiole ca. 2 cm long, the blade elliptical, obtuse, 1.5-2 cm wide, cuneate below into the petiole. **Inflorescence** a single flower, borne by a suberect to horizontal peduncle ca. 4 cm long, with a bract at the base, from near the base of a ramicaul; floral bract tubular, 8-9 mm long; pedicel 17-18 mm long; ovary 4 mm long; **sepals** light yellow-orange, with numerous, small, diffuse patches of short, red-purple hairs, the dorsal sepal erect, concave above the middle, 16 mm long, 11 mm wide, connate basally to the lateral sepals for 4 mm to form a shallow, gaping, sepaline cup, the apex rounded, contracted abruptly into a slender, acutely reflexed tail ca. 4 cm long, the lateral sepals subquadrate, oblique, connate 10 mm into transverse lamina that is deeply concave centrally, with the apices obtuse, contracted into slender, recurving tails ca. 4.5 cm long; **petals** white, cartilaginous, triangular, 5 mm long, 3 mm wide, the apex subtruncate, minutely tridentate, the labellar margin with a thick, incurved process extending beyond the base; **lip** green, dotted with purple, ovate, erect, 6 mm long, 2.75 mm wide, thickened toward the rounded base, with the margins thin, long-denticulate to fimbriate above the middle, the apex black, minutely trilobed, the base hinged beneath to the column-foot; **column** light yellow, semiterete, 4 mm long, the foot equally long with an incurved extension.

PERU: Dept. of Huánuco: without specific data, obtained from M. Arias, cultivated at J & L Orchids, 1297-547, *C. Luer 18669* (Holotype: MO).

Among the species of section *Masdevallia* subsection *Caudatae*, this species is distinguished by at least two characters found in no other species in the subsection. In common with the others, the erect dorsal sepal is shortly connate to the laterals to form a gaping flower with a short sepaline cup. The sepals are diffusely studded with small patches of short, purple hairs that appear as numerous dots. The lateral

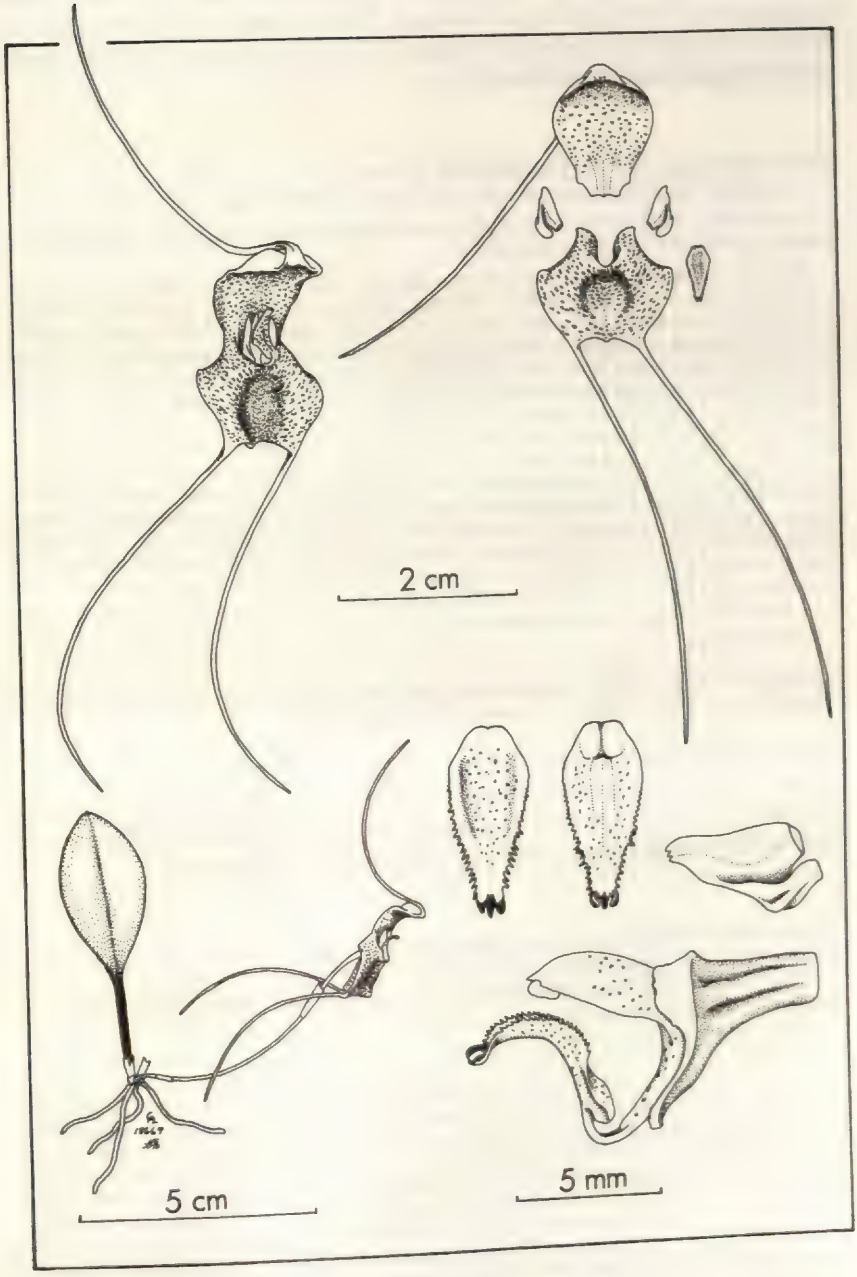

Plate 31. *Masdevallia harlequina* Luer

sepals are deeply connate to form a conspicuous, well-demarcated, central depression. The long, slender tails are reflexed. The callus of the petals is thick with square edges as it protrudes beyond the base. The lip stands erect in the center of the flower, hinged to a long, incurved column-foot. The lip is ovate with thin, long-fringed margins, unique in the subsection.

Masdevallia recurvata Luer & Dalström, sp. nov.

Ety.: From the Latin *recurvatus*, "recurved," referring to the sepaline tails.

Species haec *B. bicolori* Poepp. & Endl. affinis, sed floribus majoribus singulatim prodientibus cum caulibus sepalorum crassis recurvatis distinguitur.

Plant medium in size, epiphytic, caespitose; roots coarse. Ramicauls stout, erect, 1.5-2 cm long, enclosed by 2-3 thin, loose, tubular sheaths. **Leaf** erect, coriaceous, subpetiolate, 7-9 cm long including a petiole 1-2 cm long, the blade elliptical, subacute, 1.2-1.5 cm wide, narrowly cuneate below into the petiole. **Inflorescence** a succession of single flowers, produced in a congested raceme, borne by a stout, erect, triquetrous peduncle 10-11 cm long, with a thin bract at the base, from near the base of a ramicaul; floral bract tubular, 12-14 mm long; pedicel 12-15 mm long; ovary 6 mm long; **sepals** red-purple, orange toward the base, the dorsal sepal obovate, 10-11 mm long, 8 mm wide at the junction with the lateral sepals, connate to the lateral sepals for 6 mm to form an oblique, campanulate tube, the free portion ovate, obtuse, contracted into a stout, recurved tail 16-19 mm long, the lateral sepals ovate, oblique, 18 mm long, connate 14 mm into a concave lamina 20 mm broad expanded, forming a mentum with the column-foot, the apices subacute, contracted into stout, recurved tails 7-8 mm long; **petals** white, oblong, with the apex apiculate, 6 mm long, 1.5 mm wide, with a low, longitudinal callus above the labellar margin; **lip** oblong-subpandurate, 7 mm long, 2.8 mm wide expanded, constricted above the middle, overlaid with winglike marginal folds, the epichile suborbicular, deflexed with recurved margins, the apex rounded, apiculate, the disc with a pair of low, longitudinal calli, the hypochile oblong, featureless, the base subcordate, hinged beneath; **column** white, semiterete, 5 mm long, the foot 3 mm long with a short, free extension.

PERU: Without specific locality, imported among roots of *M. cinnamomea*, flowered in cultivation in Halmstad, Sweden, by J. Sönnemark, *S. Dalström 2270* (Holotype: MO).

This species grew from among the roots of a plant of *M. cinnamomea* Rchb.f. cultivated by Jan Sönnemark in Halmstad, Sweden. It is another of the numerous relatives of *M. bicolor*, but from them it is distinguished by larger flower produced singly and successively, and by relatively thick, recurved sepaline tails.

Myoxanthus seidelii (Pabst) Luer, Selbyana 7: 51, 1982.

Bas.: *Pleurothallis seidelii* Pabst, Bradea 2: 54, 1975.

Ety.: Named in honor of Alvin Seidel of Corupá, Santa Catarina, Brazil, collector of this species.

Plant medium to large, epiphytic, shortly repent, the rhizome stout, 0.5-1 cm long between ramicauls, the sheaths hispidous; roots coarse. Ramicauls ascending to erect, stout, 12-25 cm long, enclosed by 4-7 tubular, hispidulous sheaths. **Leaf** erect, thickly coriaceous, narrowly elliptical-ovate, acute, 10-20 cm long, 1-2.2 cm wide, cuneate below into the subpetiolate base. **Inflorescence** a fascicle of single, successive flowers, at the apex of the ramicaul; peduncles 10-15 mm long; floral bracts minutely pubescent, 3 mm long; pedicels 2 mm long; ovary 3 mm long; **sepals** green, suffused with dark brown, sparsely dotted with purple, glabrous externally, minutely pubescent within, thickly fleshy, the dorsal sepal oblong, obtuse, 11 mm long, 5 mm wide, with the margins revolute below the middle, 7-veined, the lateral sepals ovate, oblique, obtuse, connate to above the middle into a convex synsepal with revolute sides, 11 mm long, 7 mm wide unexpanded; **petals** brown with dull white apex, narrowly linear with revolute margins, from a widened base, the apex thickened, subverrucose, 9.5 mm long, 0.5 mm wide, 1.5 mm wide at the base; **lip** dull yellow-orange, oblong, thick, 6.5 mm long, 3 mm wide, the apical half suborbicular, spiculate-verrucose, with the sides revolute beneath, the disc thickened, shallowly channeled, the base subtruncate, with a pair of thin lobules, hinged on the end; **column** stout, 4 mm long, with angled wings above the middle, the foot stout, 3 mm long, concave, with a pair of marginal angles below the middle.

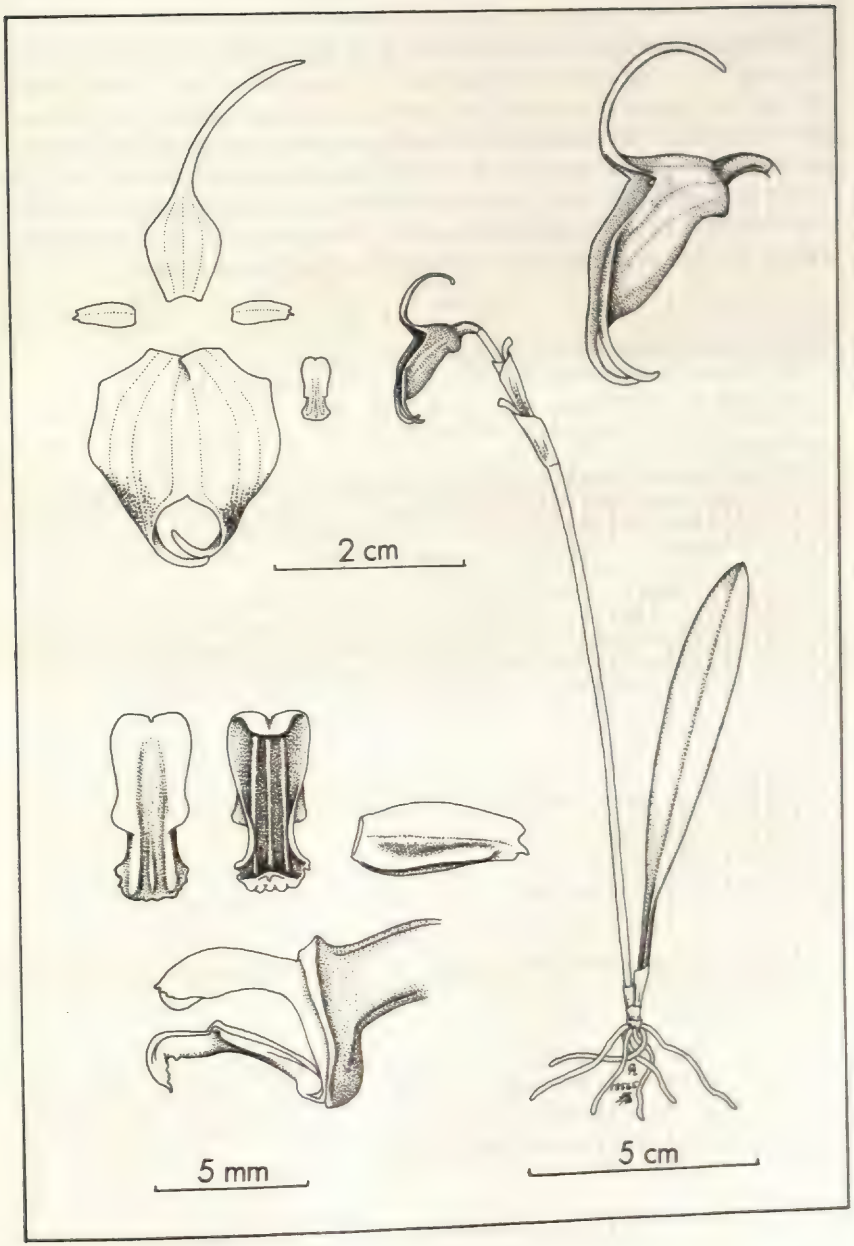

Plate 32. *Masdevallia recurvata* Luer & Dalström

BRAZIL: Edo. Espirito Santo: near Marechal Floriano, flowered in cultivation, 19 June 1973, *A. Seidel 1068* (Holotype: HB); Munic. of Marechal Floriano, São Bento de Vrânia, epiphytic in virgin forest, alt. 1000 m, 27 Sept. 1996, *A. Toscano de Brito, C. Luer, J. Luer & R. Kautsky 1019* (RB, MO), C. Luer illustr. 18059.

This species was listed in the synonymy of *M. lonchophyllus* in the revision of *Myoxanthus* in *Icones Pleurothallidinarum*-IX. An examination of fresh flowers from near the type-locality reveal a few distinct differences although the relationship is very close. Vegetatively the two species are indistinguishable. The flowers are also similar, but the sepals of *M. seidelii* are pubescent within and the lip is bulbous at the apex. The tip is suborbicular with revolute margins above the middle with the surface minutely spiculate-verrucose. The sepals of *M. lonchophyllus* are glabrous and the apex of the lip is merely convex, not bulbous-thickened

Scaphosepalum panduratum Luer & Escobar, sp. nov.

Ety.: From the Latin *panduratus*, "pandurate," referring to the violin-shaped lip.

Species haec *S. swertiifolii* subsp. *exigui* Luer & Escobar affinis, sed habitu floribusque minoribus, sepali mediani cauda incrasissima, sepalorum lateralium callis minoribus angulo interior acuminato, et petalis acutis differt.

Plant small, epiphytic, caespitose; roots slender. Ramicauls erect, slender, 0.5-1 cm long, enclosed by 2-3 tubular sheaths. **Leaf** erect, thinly coriaceous, 4.5-7 cm long including the 1-2 cm long petiole, the blade narrowly elliptical, acute, 0.8-1 cm wide, gradually narrowed below into the subpetiolate base. **Inflorescence** a raceme loose below to congested above, successively several- to many-flowered, 4-8 cm long including the slender, smooth, horizontal to descending peduncle, from low on the ramicaul; floral bracts thin, infundibular, 2 mm long; pedicel 5-10 mm long; ovary smooth, 2.5 mm long; **sepals** spotted and suffused with dark purple, the middle sepal thick, carinate, ovate, concave in the lower half, 5 mm long, 1.5 mm wide, the apex with a thick, verrucose callus; the lateral sepals connate into a concave, ovoid lamina 6.5 mm long, 6 mm wide unexpanded, the apical portion of each lateral sepal rounded, occupied by a thick, well-developed, triangular-lunate, glabrous cushion with the internal angle acuminate, 2.5 mm long, 3 mm wide, dotted with purple, the apices contracted into slender, decurved tails 6 mm long; **petals** obliquely subquadrate, 2.5 mm long, 1.25 mm wide, the apex acute, oblique; **lip** spotted with purple, pandurate, reflexed near the middle, 2.5 mm long, 1.4 mm wide, the narrowed middle with a pair of erect, denticulate laminae, the epichile rounded, erose, the hypochile subquadrate, concave, truncate minutely bilobulate; **column** semiterete, slender, 3 mm long, winged above the middle, with a thick foot equally long.

COLOMBIA: Dept. of Antioquia: Urrao, El Llavero, alt. 1400 m, collected Jan. 1990 by M. Zapata, flowered in cultivation at Colomborquídeas, Mar. 1997, *R. Escobar 8226* (Holotype: MO), C. Luer illustr. 18447.

This little species is most closely allied to *S. swertiifolium* and its subspecies *exiguum*, but differs in a smaller habit and smaller flowers. In appearance, the flowers are similar, but a thick, verrucose callus is present at the apex of the thick middle sepal. The cushions of the lateral sepals are triangular with the inner angle acuminate. The tips of the petals are acute and oblique. The lips of the two species are very similar with a flabellate, erose epichile, a narrow isthmus with a pair of denticulate lamellae, and a subquadrate hypochile.

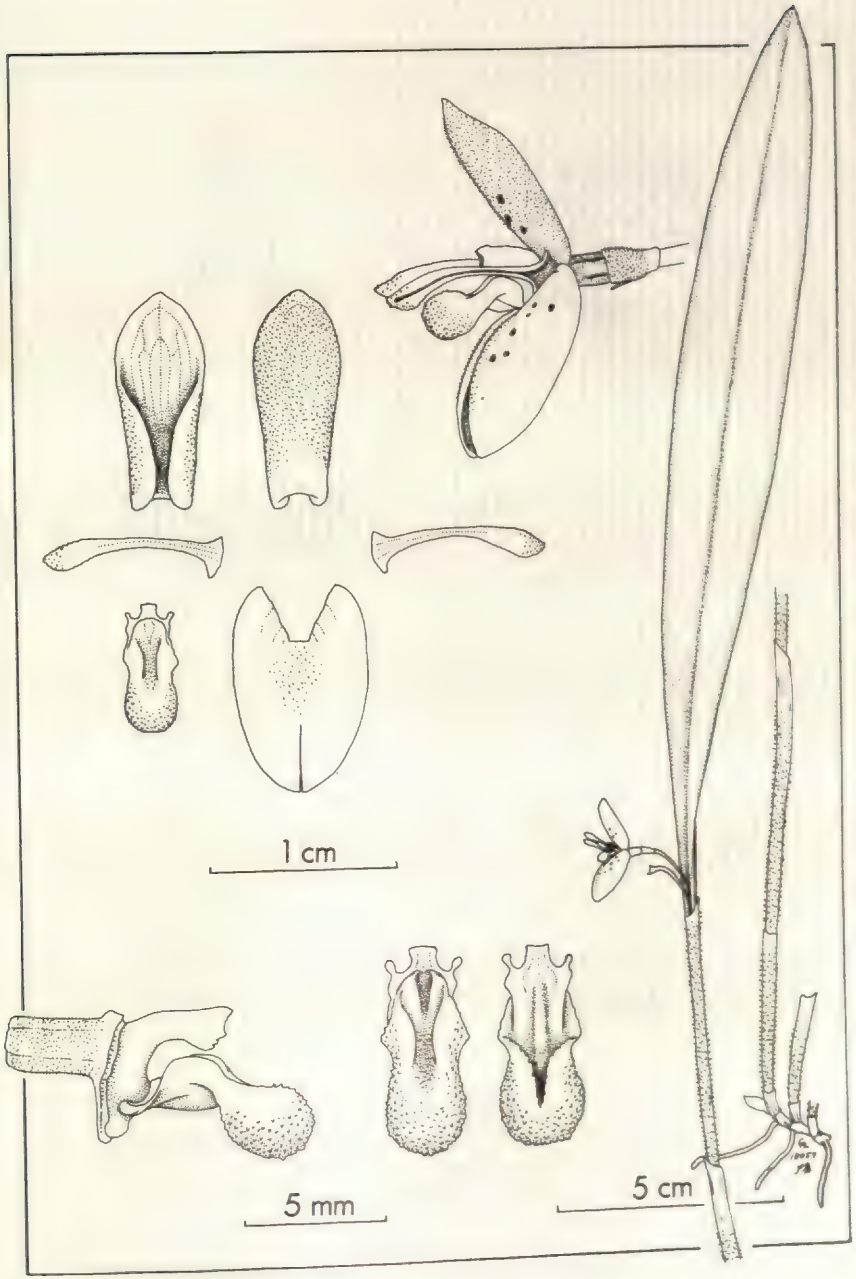

Plate 48. *Myoxanthus seidelii* (Pabst) Luer

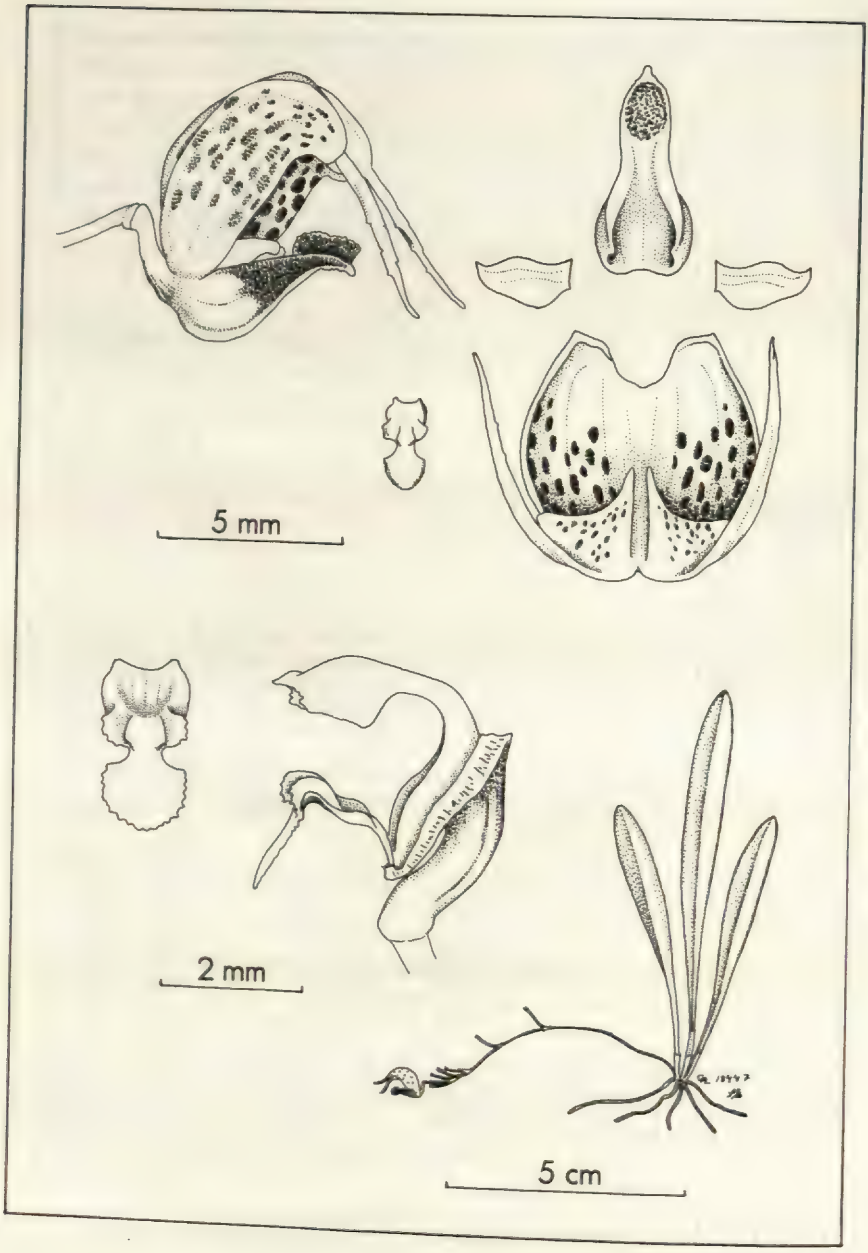

Plate 49. *Scaphosepalum panduratum* Luer & Escobar

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